

## ON THE ETHIOPIAN DIASPIDINI (COCCOIDEA)

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WITH 75 TEXT-FIGURES.

SOME 200 species belonging to genera of the tribe Diaspidini have been described or recorded from the Ethiopian region, *i.e.* the whole of the African continent south of the Sahara. Apart from a monograph by Brain on the COCCIDAE of South Africa (1915-20), these records have appeared in a wide variety of scientific journals in papers contributed by several authors, notably Newstead, Lindinger, Leonardi, Malenotti, Laing, Vayssière and the present author.

The African continent is so vast that there are still large areas that are very imperfectly known and very much larger areas that have never been searched for Coccids. This is hardly surprising when it is remembered that, prior to 1890, only a handful of explorers and missionaries had penetrated into the interior, and knowledge of the continent was largely confined to parts of the seaboard and the vicinity of the ports. Many of the earlier records, therefore, were of known species that had probably been introduced, and it was not until the interior began to become better known, and development to take place, that the wealth of Coccid species both old and new began to reveal itself. Up to the present day it is only in the Union of South Africa, Southern Rhodesia and Uganda that systematic collecting on a limited scale has been carried out, and this is reflected by the fact that 115 out of the 200 species recorded have been found in these three territories; from many of the countries there are surprisingly few records. Even in the three territories mentioned there can be little doubt, in view of their size, that very many species remain to be found, so it is quite certain that the 200 Diaspidine species so far recorded represent but a small percentage of the number actually present.

Extremely conservative generic conceptions prevailed amongst most of those who worked on the Ethiopian fauna up to 25 years ago, and then, in 1921, MacGillivray published his COCCIDAE of the World, revolutionising the classification of the Coccoidea, and of the DIASPIDIDAE in particular. In view of the conservatism of earlier workers, MacGillivray was on relatively safe ground when he erected a very large number of new genera. Unfortunately, however, he often failed to understand either the old-established genera, or even those that he created himself, with the result that his grouping of species was, in many instances, quite wrong and meaningless. It is perhaps fortunate that only one-half of the 200 Ethiopian species now known had been recorded when MacGillivray published his work. Ferris has cleared up much of the confusion which resulted from MacGillivray's work by publishing admirable drawings of the type species of genera (including many of MacGillivray's genera) in *Microentomology*, and in his *Atlas of the Scale Insects of North America*. The

value of these works as a contribution to the study of this group of insects cannot be over-estimated, but only a limited number of the species recorded from the Ethiopian region and of MacGillivray's Ethiopian genera have been available to Ferris in the course of these studies.

Whilst Ferris and, to a lesser degree, McKenzie were clearing up the confusion to which MacGillivray's work had given rise, Lindinger (1937: 178) published a list of the genera of Coccoidea that made the confusion created by MacGillivray even more chaotic. This list included a considerable amount of synonymy of the genera of Diaspidini by which many well-known genera were sunk and many others, including several of MacGillivray's genera, were fused without any apparently valid grounds. So far as the Ethiopian genera are concerned, the synonymy proposed has been disregarded except in one or two instances.

The types or either typical, or what is believed to be typical, material of over 80% of all the species recorded have been available to the author, and it is felt that this justifies an attempt to reduce them to some sort of order, and to provide a framework into which the species remaining to be found can be fitted.<sup>1</sup> The present paper has been based on the examination of this authentic material and in particular on genotypes. Many of MacGillivray's genera have been accepted in this work and, in addition, it has been found necessary to create several new genera. The latter course has only been adopted with the greatest reluctance, but in the present state of our knowledge it is not possible to assign the species concerned to any of the known genera. Of the thirteen new genera created seven are at the moment monotypical, but as the fauna becomes better known no doubt other species referable to them will be found. This view is strengthened by the knowledge that MacGillivray erected the genus *Africaspis* with only two included species—which have since been shown to be synonymous—yet eleven species have been referred to it in the present paper and it is now recognised as a well-established genus; the same applies to other genera erected by this author. Nevertheless it is realised that, as the number of species increases, gaps between certain genera may be bridged and lead to their fusion.

At least half of the small percentage of species that have not been seen by the author have been species described by Lindinger, chiefly from the Cameroons. This is unfortunate because many of these are very different from anything recorded as yet from elsewhere on the continent. So far as one can judge from our present limited knowledge, the Cameroons is the only area where a specialised fauna, showing marked differences from that of the rest of the continent, exists. It is suspected that this specialised fauna may occur right through the rain-forest area which extends from the Cameroons through French West Equatorial Africa to the northern part of the Belgian Congo. Other areas with a specialised fauna may, of course, come to light later.

One of the characteristics of the Ethiopian fauna is the high development of Chionaspiform species. An indication of this is the fact that not far short of half the total number of species have been recorded, at one time or another, either directly or indirectly as belonging to the genus *Chionaspis* Signoret. Yet, as will be shown below, it is considered extremely doubtful if this genus occurs in the Ethiopian region at all.

<sup>1</sup> The Newstead and Green collections, now incorporated in the National Collection at the Natural History Museum, were also available in the course of the preparation of this paper, through the good offices of Mr. N. D. Riley, Keeper of Entomology, who kindly expedited their return to London after the conclusion of hostilities.

The bulk of these species fall into three main groups.

1. Species in which the median pygidial lobes are widely separated, not yoked basally, often small and frequently smaller than the second lobes. These have been grouped into four genera—*Dentaspis* MacGillivray, *Dentachionaspis* MacGillivray, *Inchoaspis* MacGillivray and *Nelaspis* Hall—which are believed to be typically Ethiopian.

2. Species in which the median lobes are strongly zygotic. The genera *Africaspis* MacGillivray, *Contigaspis* MacGillivray, *Pinnaspis* Cockerell are representative of this group.

3. Species in which the median lobes are not zygotic but separated by a definite notch and yoked together by a basal sclerosis. Many of these in the past have been wrongly assigned to *Phenacaspis* Cooley & Cockerell—an Oriental genus—and three new genera *Rolaspis*, *Tecaspis* and *Voraspis* are erected for the reception of 21 of these species.

It may be remarked that a large number of Ethiopian species exhibit scleroses at the bases of the median lobes, but these are not always completely fused to form a yoke. The shape of the notch between the median lobes, also, may vary from shallow and flatly rounded to acutely V-shaped, but there is no sharp dividing line between a U- and V-notch, and therefore the shape of the notch has not been relied upon as a character of generic significance except where it is definitely linked with other distinguishing features.

Another character that has been observed in some species is a microduct arising from the capitate heads of the marginal macropores. These microducts are not always easy to detect, and in old preparations they are often very obscure. Whilst this is a character that should be looked for, the indications are that, as it is present in some instances in each of the three African genera erected for the "*Phenacaspis*" species, it has no generic importance.

The presence of gland tubercles in a submarginal position on the ventral aspect of the 4th and 5th abdominal segments is another unusual feature which is found in three species of otherwise widely different characters. They are most strongly developed in *Versiculaspis* MacGillivray but have also been noted in *Dentachionaspis* MacGillivray and *Rolaspis* Hall.

Supplementary disc pores anterior to the normal groups of perivulvar pores are a characteristic of the genus *Poliaspis* Maskell. Indications of the presence of such pores are found in many Ethiopian species, and the view is held that a species should not be referred to *Poliaspis* unless it has characters apart from this which make it congeneric with *media* Maskell, the type of the genus. On this basis, not one of the five Ethiopian species is correctly assigned to the genus, and they have been placed in genera with which they are considered to be congeneric on the basis of their other characters despite the presence of the supplementary disc pores.

In the course of the present study the author has been impressed by the fact that resemblances often exist between species that it is difficult to express in terms of key characters. Alternatively, there are species, appearing very similar from the original descriptions and drawings, that, when actually examined, prove to be quite different.

While this paper was in course of preparation, a batch of most excellent and interesting material was received from the Chief Entomologist of the Division of Entomology, Pretoria. This provided new host and locality records for some species, and included as well four new species, the descriptions of which will be found in their appropriate places in this paper.

All the genera known to the author as having been recorded from the

Ethiopian region, with the exception of a few used by Lindinger in his more recent papers on synonymy, are discussed in alphabetical order. MacGillivray in his COCCIDAE of the World neither figured nor described genera, but based their separation on a series of key characters. In all cases where a diagnosis of these genera has not been published by later workers the characters of the genus, as understood by the author, based on part of the type material are given. Figures have been included, where it has been considered necessary, to supplement those already published either by the original author or later workers. Keys for the separation of species are given for all genera containing two or more, but only those species of which either the type, part of the type material or what is believed to be authentic material, are included in these keys.

The detailed discussion of the individual genera is followed by a key for the separation of those genera accepted on the basis of material examined. Every attempt has been made to ensure that the lists of genera and species given at the end of the paper are as complete as possible, and most of the references to literature and distribution are included here. A list of species arranged under their host plants is also given.

The terminology followed is substantially the same as that adopted by Ferris in his *Atlas of the Scale Insects of North America*.

#### Genus *Adiscoforinia* Leonardi.

Represented by a single species, *A. pygosema* Green & Laing, described from Tanganyika on an unknown host plant. The genus is probably of Oriental origin.

#### Genus *Africaspis* MacGillivray.

Genotype:—*Diaspis chionaspiformis* Newstead.

#### *Diagnosis.*

Referable to the tribe Diaspidini. Body elongate, pyriform or fusiform. Pygidium with median lobes well developed, close together with at least their inner angles fused (except in one species), without setae, gland spines or marginal pore between the bases of the lobes. Other lobes represented by small dentate projections of the margin. Marginal pores, particularly those of the first two interlobular spaces, heavily sclerotised. Gland spines of the pygidial fringe normally arranged in pairs in the usual positions. Dorsal pores in well-defined segmentally arranged series as far as the 5th segment; on the 6th segment the pores, if present, are usually confined to a few in the submarginal series. Similar pores occur marginally of all segments as far as the mesothorax, and groups of gland tubercles occur in the usual positions. Perivulvar pores normally present in five groups but in one species they are entirely wanting and in another supplementary groups of pores are present in addition to the normal five groups of perivulvar pores. Anal orifice situated towards the base of the pygidium.

Scale of the adult female white, elongate, broadening posteriorly; male scale white, elongate, with more or less parallel sides and usually uncarinated.

#### *Notes.*

The genus *Africaspis* is characterised by the nature of the median lobes, the small dentate projections replacing the other lobes and the heavy sclerotisation of the marginal pores of the first two interlobular spaces. It comes closest to *Contigaspis* MacGillivray, a genus in which the median lobes are smaller and which lacks the dentate marginal projections and sclerotisation of the marginal pores. Lindinger (1937:178) placed *Africaspis* as a synonym of *Anoplaspis* Leonardi, a genus to which it bears little or no resemblance at all.

Eleven species are here referred to the genus; most of these have, in the past, been assigned to *Pinnaspis* Cockerell but they are clearly distinct from that genus as at present understood. One species—*parinari* Hall—was described originally as a *Poliaspis*, attention being drawn at the time to its similarity to *Africaspis chionaspiformis* (Newstead). It has been included here because it has obviously greater affinities with *Africaspis* than *Poliaspis*. At the same time it differs from typical *Africaspis* in having median lobes, although very close together, not fused at their inner angles and with two small setae between them and with gland spines of the pygidial fringe more numerous.

In *caffra* Brain the median lobes appear to be separated, but the sclerotisation at the base of the lobes is such that it is impossible to say whether the inner angles are actually separated or not. This species also differs from the genotype and all other included species in having gland spines of an unusually broad plate-like character.

As a result of the examination of further material of *Chionaspis* (*Pinnaspis*) *communis* var. *monotes* Hall it is considered that this species should be united with *A. chionaspiformis* (Newstead). *Chionaspis cassiae* Newstead has already been synonymised with *chionaspiformis* by Laing (1929: 479). The forms described as *Chionaspis* (*Pinnaspis*) *communis* var. *diospyros* Hall and *C. (P.) communis* var. *berliniae* Hall are believed to be distinct and are here raised to specific rank. *Chionaspis fici* and *berliniae* are very closely allied and further knowledge of the two species may lead to their union, but on the basis of the material at present available they are separable. The same remarks apply also to *chionaspiformis* and *communis*.

The genus *Africaspis* is almost certainly African in origin, and is widely distributed throughout eastern and southern Africa. The genotype is a variable species that is common throughout the whole area and it is fully expected that further collecting will add to the present well-defined group of species. The fact that one species—*pattersoni* Green & Laing—occurs in the Gold Coast suggests that the distribution may eventually be found to be general.

The species may be separated by the following key:—

1. Supplementary groups of disc pores present on the ventral side of the body anterior to the normal groups of perivulvar pores *parinari* Hall. Without such supplementary groups of disc pores . . . . . 2.
- 2(1). Perivulvar pores wanting . . . . . *pattersoni* Green & Laing. Perivulvar pores in the normal five groups . . . . . 3.
- 3(2). Pygidial gland spines replaced by broad plate-like structures that are divided apically into two to four processes; they are arranged singly in the usual positions . . . . . *caffra* Brain (figs. 1, 31). Pygidial gland spines of the normal simple type . . . . . 4.
- 4(3). Dorsal pores very few in number; submedian series, where present, represented by one to three pores . . . . . *chippingae* Hall. Dorsal pores well represented in both submarginal and submedian series 5.
- 5(4). Submarginal and submedian groups of dorsal pores on segment 5 arranged in a very regular interrupted single line; pores on segment 6 confined to two or three marginally . . . . . *baphiae* Hall. Dorsal pores on segment 5 usually numerous, arranged in a regular series but never in a very regular single line: segment 6 with a submarginal group of usually more than 3 pores . . . . . 6.
- 6(5). Median lobes always with a deep lateral notch, relatively large and prominent except in one species . . . . . 7. Median lobes with never more than a faint indication of a lateral notch, usually relatively small . . . . . 9.

- 7(6). Median lobes squat; gland spines of the pygidial fringe often arranged in groups of three . . . . . *communis* Hall.  
 Median lobes prominent; gland spines arranged in pairs . . . . . 8.
- 8(7). Gland spines on the pygidium and margins of all but the 1st free abdominal segment long and conspicuous, the longer spines of the pygidial fringe average 50  $\mu$ ; submedian group of pores on the 6th segment represented by 3 to 5 pores often forming a continuous series with the submarginal group . . . . . *diospyros* Hall.  
 Gland spines shorter, particularly marginally of the 2nd and 3rd abdominal segments, the longer spines of the pygidial fringe average 30  $\mu$ ; submedian group of pores on the 6th segment, if present, represented by a single pore . . . . . *chionaspiformis* Newstead.
- 9(6). Perivulvar pores numerous; median 2-8, anterior laterals 23-35, posterior laterals 42-65 . . . . . *fici* Newstead.  
 Perivulvar pores less numerous, the corresponding groups containing about half the number of pores . . . . . 10.
- 10(9). Dorsal pores numerous and on segments 4 and 5 confined to well-defined series; pygidial gland spines small and inconspicuous, the longer spines averaging 10  $\mu$  . . . . . *scutiae* Brain (fig. 32).  
 Segments 4 and 5 with supplementary series of from two to eight pores in addition to the well-defined series; pygidial gland spines relatively conspicuous, the longer spines averaging 30  $\mu$  . . . . . *berliniae* Hall.

Genus *Ambigaspis* MacGillivray.

Genotype :—*Pseudaonidia lycii* Brain.

*Diagnosis.*

Referable to the tribe Diaspidini. Body more or less turbinate in shape, broadest in the thoracic region with anterior margin flatly rounded and lateral margins more or less parallel but with the mesothorax on either side tending to be produced. Thoracic region strongly sclerotised. Lateral margins of prepygidial segments clearly produced. Pygidium broadly rounded with three pairs of lobes. Median lobes neither zygotic nor yoked together and with only a pair of setae between their bases. All lobes with their axes somewhat convergent, acutely rounded apically with well-developed small scleroses arising from the inner and outer angles of the bases of each. Second and third lobes not duplex. Gland spines occurring in the usual positions in twos or threes, except between the median and second lobes, where there is apparently only one. Dorsal and marginal pores relatively small with no very definite arrangement on the pygidium but on the prepygidial segments submedian groups are distinct and well separated from those of the margin and submarginal areas. Gland tubercles present in the usual positions. Perivulvar pores wanting. Anal orifice near the base of the pygidium.

Scale of the adult female more or less circular, low convex, dull brown with exuviae well within the margin. Male scale greyish-white uncarinated with terminal exuvia.

*Notes.*

This genus at present contains the type species only. It was originally described as a *Pseudaonidia*, and MacGillivray in erecting a new genus for its reception also assigned it to the Aspidiotini. Ferris (1938a : 58) pointed out that the species is definitely Diaspidine, and this is undoubtedly the case, despite certain unusual features. It is a peculiar form of uncertain affinities.

Lindinger (1937 : 178) placed this genus as a synonym of *Epidiaspis* Cockerell, a genus from which, in the author's opinion, it is quite distinct.

Genus *Andaspis* MacGillivray.

The genotype—*hawaiiensis* Maskell—which is known from the tropical and subtropical regions of various parts of the world occurs in Africa. *Lepidosaphes punicae* Laing is also assigned to this genus, despite obvious differences from the genotype. It may have to be removed at a later date, but for the time being it is best included here. The two species may be separated as follows :—

1. Each median lobe with a conspicuous club-shaped sclerosis extending inwards from the basal median angle; absence of dorsal ducts posterior to the 4th segment; a sclerotic spur at the anterior lateral angle of both segments 3 and 4 . . . . . *hawaiiensis* Maskell.
- Each median lobe with a small outer and inner sclerotic incassation; a relatively large irregularly elongate group of dorsal pores on the pygidium of the same size as those of the regular series on segment 4 and much smaller than the large and conspicuous marginal pores; anterior lateral angles of segments 3 and 4 without sclerotic spurs . . . . . *punicae* Laing.

Brain recorded (1919 : 220) *Howardia moorsi* Doane & Ferris from S. Africa. This name has since been sunk as a synonym of *A. hawaiiensis* Maskell.

Genus *Aonidomytilus* Leonardi.

Three species are included in this genus, *A. albus* (Cockerell), of which *Coccomytilus dispar* Vayssièrè is a synonym, *Lepidosaphes brachystegiae* Hall and *L. mazoensis* Hall, the two latter from S. Rhodesia. According to Ferris (1937 : 5) this genus is strictly New World; *albus* Cockerell has probably been introduced into Africa, but it is doubtful if the same is true of the other two species. *A. brachystegiae* differs from the genotype in the presence, in some specimens, of a small tuberculiform process at the anterior lateral angle of abdominal segments 2 and 3, but the development of these varies considerably; in some individuals they are clear, whilst in others they are doubtfully present; *mazoensis* differs in having a marginal macropore between the bases of the median lobes. Apart from these differences, the two species bear a close resemblance to *Aonidomytilus*, and they may well be placed here, at least until the African fauna is better known.

The three species may be separated as follows :—

1. With a marginal macropore between the median lobes; median lobes separated by a distance nearly the width of one; perivulvar pores present  
*mazoensis* Hall.
- Without a marginal macropore between the median lobes; median lobes set close together; perivulvar pores present; if median lobes separated by a distance nearly the width of one, perivulvar pores are wanting . . . 2.
2. Median lobes set apart by about the width of one; gland spines of the pygidial margin simple and sharply pointed; perivulvar pores wanting  
*albus* Cockerell.
- Median lobes set close together; gland spines of the pygidial margin, particularly those towards the base, forked at the apex; perivulvar pores in five groups . . . . . *brachystegiae* Hall.

Genus *Asymmetraspis* MacGillivray.

Genotype :—*Chionaspis distorta* Newstead (fig. 33).

*Diagnosis.*

Referable to the tribe Diaspidini. Body oval with the anterior half strongly sclerotised and sometimes distorted. Median lobes with their bases yoked together but not zygotic;

with a pair of setae between the lobes but no marginal macropore. Second lobes, if present, poorly developed. Marginal gland spines very small and inconspicuous. Marginal pores relatively small and rather inconspicuous. Dorsal pores similar in size to the marginal pores, few in number but arranged in definite rows on the 4th, 5th and 6th segments. Anal and genital orifices situated near the base of the pygidium. Perivulvar pores wanting.

Scale of adult female small, white, narrow and strongly convex.

#### Notes.

This genus contains only the type species described from S. Africa on *Protea hirta*. It is very close to *Bantudiaspis* Hall, from which it differs in lacking a marginal pore between the bases of the median lobes, in having the dorsal pores, few though they may be, in well-defined series and in having the anal and genital apertures situated near the base of the pygidium. It is quite possible that further species may be found bridging the present gap between the two genera, and it may be regarded of some significance that *A. distorta* (Newstead) and *B. faureae* (Hall) should both occur on plants belonging to the PROTEACEAE, but for the present the two genera are regarded as distinct.

Brain (1920 : 102) placed *distorta* Newstead as a synonym of *Chionaspis* (*Dinaspis*) *distincta* Leonardi. Examination of type material of the former and material of the latter determined by Brain himself show the two species to be entirely different. MacGillivray included *Chionaspis tenuidisculus* Newstead and *C. dura* Newstead in the genus but in the author's opinion these species are definitely not congeneric with *distorta* Newstead.

#### Genus *Augulaspis* MacGillivray.

Genotype :—*Chionaspis nudata* Newstead (figs. 2, 34).

#### Diagnosis.

Referable to the tribe Diaspidini. Body broadly fusiform with groups of small parastigmatic pores associated with both anterior and posterior spiracles. Pygidium broadly rounded with two pairs of lobes. Median lobes well separated by a deep notch, but with their bases not yoked together and without gland spines or marginal pores between; second lobes small and duplex. Gland spines of the pygidial fringe apparently confined to a single spine in each of the first two interlobular spaces. Dorsal pores with short ducts very numerous and arranged in regular broad bands; on the 6th segment the submarginal and submedian series are confluent and consist of about 50 pores; on the 7th segment only the submarginal series is present; on segments 5 to 3 the series are separated but anterior to this, as far as the mesothorax, the pores become fewer and the series are not clearly separated. Gland tubercles doubtfully present but, if present, very small and inconspicuous. Perivulvar pores present. Anal orifice situated towards the base of the pygidium.

Scale of adult female opaque white, convex, broadened posteriorly, rather thick and coarsely striated transversely with golden exuviae. Male scale white, flat and uncarinated.

#### Notes.

This genus is so far represented only by the type species from Tanganyika. It bears a strong resemblance to *Versiculaspis* MacGillivray, from which it differs in having large groups of perivulvar pores, and in lacking the conspicuous inwardly directed (but not fused) sclerotic bands arising from the bases of the median lobes and the group of conspicuous gland tubercles on the 5th segment.



Genus *Aulacaspis* Cockerell.

This genus is not of African origin and probably all the six species here included have been introduced. Whether *tegalensis* Zehntner and *mediunensis* Zehntner, both originally described from Java on sugar-cane, are correctly assigned may be open to question; the median lobes have not the appearance of being sunken into the apex of the pygidium although they have a small notch separating them. Another Oriental species having similar characters is *A. wakayamaensis* Kuwana, described from Japan (1926 : 33). *A. herbae* Green has hitherto been placed in the genus *Chionaspis*, but in the author's opinion it would be more properly placed in *Aulacaspis*. *A. cinnamomi* var. *mangiferae* Newstead is here regarded as a synonym of *A. cinnamomi* Newstead.

The species may be separated as follows :—

- 1. Median pygidial lobes prominent and not appearing sunken in an apical indentation of the pygidium; not divergent . . . . . 2.
- Median lobes not prominent, sunken and divergent . . . . . 3.
- 2(1). With four pairs of pygidial lobes, the lobules of the three lateral pairs being well developed and of more or less uniform size; prothorax with a well-developed lateral process on either side. . . . . *mediunensis* Zehntner.
- With three pairs of lobes, the outer lobules of the 2nd and 3rd pairs smaller than the inner lobules; thoracic margin broadly and evenly rounded . . . . . *tegalensis* Zehntner.
- 3(1). Margin with well-developed thoracic processes . . . . . 4.
- Margin without thoracic processes . . . . . 5.
- 4(3). Body relatively large; perivulvar pores numerous, median 31, anterior laterals 55, posterior laterals 19; with about 7 gland spines marginally of segment 4 on each side . . . . . *fulleri* Cockerell (figs. 3, 35).
- Body relatively small; perivulvar pores much less numerous, about half those quoted for *fulleri*; with usually only 2 gland spines marginally of segment 4 . . . . . *cinnamomi* Newstead.
- 5(3). Female scale circular; 2nd and 3rd lobes prominent, with the lobules longer than broad; with usually 3 gland spines laterally of the 4th segment on either side . . . . . *rosae* Bouché.
- Female scale of irregular shape, usually broadly pyriform; 2nd and 3rd lobes squat with the lobules broader than long; with usually more than 3 gland spines laterally of the 4th segment. Associated with Gramineae . . . . . *herbae* Green.

Genus **Balaspis** gen. n.

Genotype :—**Balaspis faurei** sp. n.

*Diagnosis.*

Referable to the tribe Diaspidini. Body oval in outline when mounted, at most very faintly sclerotised with the exception of the pygidium and with margins of free abdominal segments not strongly produced laterally. Pygidium broadly rounded with three pairs of small obcoical lobes, median lobes neither zygotic nor yoked together basally, without a macropore but with a pair of gland spines between them; second and third lobes duplex. Gland spines of the pygidial fringe in groups of from 2 to 4 spines. Dorsal pores in well-defined interrupted series on the 3rd, 4th and 5th segments, on the 6th segment the series is continuous. Similar pores occur marginally of all segments as far anterior as the anterior spiracles. Gland tubercles extremely few and inconspicuous. Just posterior to both the anterior and posterior spiracles are loose groups of minute tubular pores. Perivulvar pores wanting. Anal orifice situated towards the base of the pygidium.

Scale of adult female white, moderately to highly convex, rather strongly broadened posteriorly, exuviae of an amber shade. Male scale white, parallel sided, uncarinated.

*Notes.*

This genus is erected for the reception of a single species from S. Africa, described below. It comes close to *Mitulaspis* MacGillivray, from which it differs in body shape, in lacking the characteristic nature of the lateral margins of the free abdominal segments, the absence of a macropore between the median lobes and the definite arrangement of the dorsal pores of the pygidium into series.

***Balaspis faurei* sp. n. (figs. 4, 36).**

Scale of adult female small white, moderately to highly convex according to position; in the former case rather strongly broadened posteriorly; in the latter not so widely broadened. Exuviae amber coloured. Secretory appendix with faint irregular transverse striations. Ventral scale persistent along the lateral margins.

Male scale white, with parallel sides, uncarinated.

Length of scale of adult female 1.25–1.5 mm.; breadth 0.8–1.0 mm.

Body of adult female more or less oval in outline when mounted, and at most very faintly sclerotised except for the pygidial region. Antennal tubercle with two or three minute processes and usually two setae of more or less equal lengths. A group of about 12 parastigmatic glands associated with the anterior spiracles. Margins of abdominal segments not strongly produced laterally. Pygidium with a rather well-defined sclerotic pattern, rounded, with three pairs of small conical lobes, median pair separated by a distance rather less than the width of one, not yoked together at their bases but with a pair of small gland spines between them; second lobes duplex, with the lobules of the same shape as the median lobes, the inner lobules being very little smaller than the median lobes but larger than the outer lobules. Third pair of lobes similar but rather smaller and inconspicuous. Gland spines simple, arranged in the usual positions in groups of two to five spines. Marginal and dorsal pores of uniform size, the latter occurring as far as the 6th segment, on which there is a well-defined series running from the submedian area to the margin; on segments 5, 4 and 3 the pores are arranged in well-defined series interrupted to form submedian and submarginal series. Groups of similar pores occur marginally of all segments as far as the anterior spiracles. Submedian series do not occur anterior of the 3rd segment but are replaced by a few scattered pores of a much smaller size; groups of these pores occur just posterior of the posterior and anterior spiracles. Gland tubercles extremely few and inconspicuous, never more than one or two present. Perivulvar pores wanting. Anal orifice situated towards the base of the pygidium.

On *Euphorbia* sp., Sutherland District, Cape Province, coll. J. C. Faure, Nov. 1917, S.N. 2487; Robertson, Cape Province, coll. Van der Merwe, Jan. 1920, S.N. 2484. In both cases the material consisted of pieces of heavily infested small branches.

This species is named in honour of an eminent entomologist—Professor J. C. Faure of the Transvaal University, Pretoria.

Genus *Bantudiaspis* Hall.

This genus, as has already been indicated (p. 504), is extremely close to *Asymmetraspis* MacGillivray. At present these two genera are known only from S. Rhodesia and S. Africa. The species show a decided preference for crevices in the bark and, being small, would be very inconspicuous were it not for the fact that the scales are often white. It is probable that other species will be found in due course.

In addition to the type species—*loranthi* Hall—*faureae* Hall is included. Both species are from S. Rhodesia. A third species, *rhusae* Hall, is here united with *loranthi* Hall, a name which has page preference. A study of the series of slides of the two species now available shows that there are not sufficient constant differences to permit separation. On the other hand, there are differences in the shape and texture of the female scales. They are always small, but in the material from the different host plants examined may vary from very low convex, when they are subcircular or very broadly pyriform, to highly convex when they are narrowed and little broadened posteriorly. On *Rhus* the scales are pale brown and although not particularly thin have a semitranslucent appearance; on *Loranthus* they are more nearly white, whilst on *Turraea nilotica* (MELIACEAE) they are definitely white. Specimens on *Rhus legali* from Cape Province were identical with those of typical *rhusae* from S. Rhodesia. The form on *Loranthus* is intermediate between those on *Rhus* and *Turraea* with no sharp dividing line between those on *Rhus* and *Loranthus* on the one hand and *Loranthus* and *Turraea* on the other. In view of this, all the material is united under the name *loranthi*.

Ferris (1937 : 123) drew attention to the similarity between *Bantudiaspis loranthi* (Hall) and his *Situlaspis multipora*, which he referred with some doubt to *Situlaspis*. The same author later (1941 : 274) erected a new genus *Crassaspis* with *multipora* as type. In so doing, he remarked that in the light of further study the resemblance between the two species above mentioned had become much reduced, and he remarked that the genera *Crassaspis* and *Situlaspis* were apparently of the same stock as *Diaspis* and *Epidiaspis* Cockerell, and that this stock, while highly developed in the Neotropical region, is also represented in eastern Africa. The genera *Asymmetraspis* MacGillivray and *Bantudiaspis* represent African offshoots from this stock.

*B. loranthi* Hall and *B. faureae* Hall may be separated as follows :—

1. Dorsal pygidial pores definitely smaller than the marginal pores; second pygidial lobes either wanting or extremely inconspicuous . . . *faureae* Hall.
- Dorsal and marginal pores of much the same size; second lobes duplex, small but clearly represented; third lobes very poorly developed  
*loranthi* Hall.

#### Genus *Carulaspis* MacGillivray.

Brain (1924 : 14) recorded *Diaspis carueli* Targioni on *Cupressus* from S. Africa, and later Munro and Fouché (1936 : 86) recorded it on *Cupressus*, *Juniperus*, *Thuja* and *Viscum* from the same country. Specimens of this species from the Ethiopian region have not actually been seen by the author, but there is no reason why it should not have been introduced into S. Africa.

MacGillivray erected a genus *Carulaspis* with *Aspidiotus juniperi* Bouché as type, but this species, as well as *Diaspis carueli* Targioni, are now recognised as synonyms of the earlier *Coccus visci* Schrank, which latter species therefore becomes the type of the genus. The separation of *Carulaspis* from *Diaspis* Costa is based on the presence of a small pair of gland spines between the median lobes and the reduction of the pores on segment 6 to a single submarginal pore in the former genus.

#### Genus *Chionaspis* Signoret.

It was customary for the earlier authors to place in the genus *Chionaspis* all those species in which the female scales were white and elongate, broadened posteriorly to a greater or lesser degree, with terminal exuviae. Later authors placed some of the species of this general type in other genera, but of the

200 odd known species of the tribe Diaspidini from the Ethiopian region over one-third have been placed either directly or indirectly in the genus *Chionaspis*. This is some indication of the strong development of the species of this same superficial appearance.

*Chionaspis salicis* L., the type of the genus, has the following characters:—

The dermis of the adult female, with the exception of the pygidium, not sclerotised. Median pygidial lobes projecting from the margin with their inner angles extremely close together and with a conspicuous basal sclerotic yoke, but without pores or gland spines between them. Second lobes present and clearly duplex, smaller than the median lobes. Gland spines well developed and in pairs. Dorsal pores in well-defined segmentally arranged rows which are interrupted to form submedian and submarginal series; the submedian series extend as far as segment 6 but the submarginal series do not occur beyond segment 5. The pores of the submedian series on segments 3 and 4 are definitely smaller than those of the corresponding series on segments 5 and 6. Perivulvar pores present.

Of all the *Chionaspis* species from the Ethiopian region that have been seen, only two are retained here—*sterculiae* Laing and *lutea* Newstead. *Chionaspis sterculiae* has some claims to be retained in the genus but it differs from the genotype of *Chionaspis* in being narrowly elongate with faintly but clearly sclerotised dermis, the absence of a submedian series of pores on segment 6 and the median area of the thoracic and 1st and 2nd abdominal segments with numerous tubercles. It is only retained in the genus with considerable hesitation, but it is thought best to adopt this course until the Ethiopian fauna is better known.

*Chionaspis lutea* Newstead has no claims whatever to inclusion in the genus, but in view of the problem it presents it has been left there for the time being. The species was originally described as a *Chionaspis* by Newstead (1911a : 169) from Amani, Tanganyika, on a forest tree. The same author later (1917a : 133) recorded it as *Chionaspis* (*Phenacaspis*) *lutea* from the Gold Coast on *Funtumia* (APOCYNACEAE) with the statement "the male puparia associated with the females in this colony are very strongly tricarinate and not at all like those in the type lot described from East Africa. Possibly the West African examples belong to a species of *Diaspis*. The ♀♀ are specifically identical with the co-types of *C. lutea*."

A very small piece of the original material from Amani, carrying some female but no male scales, has been available for examination. Figs. 5, 6 and 37 have been drawn from these specimens. It will be seen at once that it is not a *Chionaspis*. Further, the median lobes are clearly not yoked together basally, they have a marginal macropore between them and the nature and arrangement of the dorsal pores on the pygidium are characteristics which preclude its inclusion in *Phenacaspis*. The characters of the pygidium (fig. 37) are typical of *Diaspis*, yet the body shape (fig. 5) is not turbinate as found in that genus and the female scale is typically *Chionaspis*form with terminal exuviae (fig. 6). The shape of the scales shows considerable variation according to position, some being narrowly elongate whilst others are much broadened posteriorly. The specimen figured represents an intermediate form, but in every case the exuviae are definitely terminal. Were it not for this, one would have no hesitation in assigning it to the genus *Diaspis*.

#### Genus *Cocco-mytilus* Leonardi.

Four species have at one time or another been referred to this genus—*dispar* Vayssière, which is now accepted as a synonym of *Aonidomytilus albus*

Cockerell, *bambusicola* Cockerell, which is here referred to the genus *Kuwanaspis* MacGillivray, *chitinosus* Lindinger and *somalensis* Malenotti. The last two species have not been seen, but from the descriptions it would appear to be quite clear that neither is congeneric with *convexa* Maskell, the type species of *Coccomytilus*.

#### Genus *Contigaspis* MacGillivray.

Genotype :—*Chionaspis subnudata* Newstead (figs. 8, 40).

#### *Diagnosis.*

Referable to the tribe Diaspidini. Body fusiform or broadly fusiform with membranous dermis. Pygidium broadly rounded with a pair of small and inconspicuous median lobes which are not only zygotic but, over their basal halves at least, in the closest apposition. Other lobes wanting. Marginal gland spines small and inconspicuous. Marginal and dorsal pores of much the same size, the latter not arranged in well-defined series. Submedian groups on the 5th and 6th segments represented by a few pores, which are replaced typically on the segments anterior to these by pores of a very much smaller size. Scattered pores occur in the marginal areas from the pygidium to the anterior spiracles and a few gland tubercles are present in the usual positions. Perivulvar pores present. Anal orifice situated slightly towards the base of the pygidium.

Scale of adult female, small, white, low convex and broadened posteriorly. Male scale tricarinate or at least with a median carina.

#### *Notes.*

This genus comes close to *Africaspis* MacGillivray and *Gadaspis* Hall; from the former it differs in lacking the characteristic sclerotisation associated with the marginal pores of the first two interlobular spaces, in the smaller size of the median lobes and the poor development of the pygidial gland spines; from the latter it differs in having relatively small and not prominent lobes that are not in the closest apposition throughout the entire length of their inner margins, and in the poor development of the pygidial gland spines.

*Indigoferae* Hall, *cyanogena* Cockerell and a new species described below are included in addition to the genotype. MacGillivray himself included only the genotype and *scutiae* Brain, but the latter species is referable to *Africaspis* MacGillivray. It may also be pointed out that MacGillivray gave as a major character for separating the genus in his key "pygidium of adult female always without plates." In both *subnudata* and *scutiae* plates—or gland spines as they are referred to in this paper—are definitely present, small and inconspicuous though they may be.

When describing *subnudata*, Newstead drew attention to the fact that it was closely allied to *nudata* Newstead. It is not clear on what grounds this statement was made, as an examination of part of the type material of both species shows them to be very different.

#### *Contigaspis naudei* sp. n. (figs. 7, 39).

Scale of adult female small, white, with a smooth rather glossy surface that is often partially obscured by extraneous matter, moderately to highly convex and moderately broadened posteriorly. Exuviae very pale lemon coloured. Ventral scale very thin, remaining adherent to the host plant.

Male scale very small with more or less parallel sides and apparently with a median carina only.

Length of scale of adult female 1.0–1.2 mm.; the width and convexity vary considerably according to position.

Body of adult female broadly oval in outline when mounted, membranous except for the pygidial region. Antennal tubercles with a single curved seta. A group of 10–15 parastigmatic glands associated with each anterior spiracle and one of about 4 with each posterior spiracle. Pygidium with only the median pair of lobes represented; these are zygotic with a truncheon-shaped sclerosis arising from the point of zygotis: each lobe has a single deep notch in the outer lateral margin. Gland spines simple, occurring in pairs in the usual positions. Dorsal pores not arranged in well-defined series, submedian groups confined to the 3rd to the 6th segments, the number of pores in each group usually 3 or 4. Similar pores occur in the marginal and submarginal regions of all segments as far anterior as the mesothorax. Gland tubercles rather numerous, occurring in the usual positions, as far as the vicinity of the anterior spiracles. Perivulvar pores in five groups, median 5–10, anterior laterals 11–20, posterior laterals 11–16 (average of 18 examples 8:14:15). Anal orifice situated near the centre of the pygidium.

On small twigs of *Cassia mimosoides* (LEGUMINOSAE), ZULULAND: Port Durnford, coll. P. C. Kotze, 20.xii.26.

I have pleasure in naming this species after Dr. T. J. Naudé, Chief of the Division of Entomology, Pretoria, through whose kindness I have been able to examine many of Brain's species that would not otherwise have been available to me.

The four species here included in the genus *Contigaspis* MacGillivray may be separated as follows:—

1. Median lobes falling away laterally with one or two deep and conspicuous notches; dorsal pores of the submedian groups on segments 3 to 6 of uniform size . . . . . 2.
- Median lobes more or less quadrate, usually with no trace of a lateral notch or at most with only a faint indication of a notch; pores of the submedian groups on segments anterior to the 5th replaced by others of a much smaller size . . . . . 3.
- 2(1). Median lobes with a single deep lateral notch; small but prominent and about as long as broad . . . . . *naudei* sp. n. (figs. 7, 39).
- Median lobes with two lateral notches, small, not prominent and distinctly broader than long . . . . . *cyanogena* Cockerell (fig. 38).
- 3(1). Median lobes relatively large and prominent (each lobe about 12  $\mu$  broad); setae of the 1st interlobular spaces short, not extending beyond the apices of the median lobes . . . . . *indigoferae* Hall.
- Median lobes small and inconspicuous (each lobe about 8  $\mu$  broad); setae of the 1st interlobular spaces long, three or four times the length of the median lobes . . . . . *subnudata* Newstead (figs. 8, 40).

#### Genus *Cooleyaspis* MacGillivray.

Genotype:—*Chionaspis praelonga* Newstead.

#### *Diagnosis.*

Referred to the tribe Diaspidini. Body very narrow and elongate with roughly parallel sides. Pygidium rounded. Median lobes with their bases yoked together, but separated by a rather deep U-shaped notch. Second lobes duplex, well developed, the inner lobules being just as large and usually larger than the median lobes. Dorsal pores in well-defined regular interrupted series, the submedian series extending as far as the 6th segment, but the submarginal series not occurring beyond the 5th segment. Marginal macropores and gland spines in the usual positions, the latter arranged singly. Perivulvar pores in five groups

which tend to be confluent; on the segment preceding a supplementary transversely orientated group of similar pores. Anal orifice near the base of the pygidium. Margin of prepygidial segments as far as the metathorax, with numerous pores similar to the dorsal pores on the pygidium and a few gland tubercles in the usual positions.

Scale of adult female white, very elongate and narrow, with parallel sides and complete ventral scale. Male scale white and very faintly tricarinate.

*Notes.*

This genus belongs to the *Phenacaspis* Cooley & Cockerell, *Rolaspis*, *Tecaspis*, *Voraspiis* group of genera, from all of which it is differentiated by the curious transverse group of supplementary pores. The number and arrangement of these pores is unlike that found in the species which have in the past been assigned to *Poliaspis*. Only the type species is known at present.

Genus *Coronaspis* MacGillivray.

MacGillivray assigned *Chionaspis auratilis* Newstead from Uganda to this genus, the type of which is a Ceylon species—*C. coronifera* Green. In the author's opinion *auratilis* is not congeneric with *coronifera*, the male scales are quite different, and in *auratilis* the second lobes are strikingly larger than the median lobes and the pygidial fringe different.

Genus *Credodiaspis* MacGillivray.

This genus was erected by MacGillivray for a single species—*Cryptodiaspis limuloides* Lindinger—from the Cameroons. In the key to genera given by that author the only character separating it from the genus *Cryptodiaspis* Lindinger is the absence of perivulvar pores. This in itself would be insufficient grounds for the separation but unfortunately neither *limuloides* nor the other two species of *Cryptodiaspis* have been seen and no opinion can, therefore, be expressed.

Genus *Cryptodiaspis* Lindinger.

This genus was erected by Lindinger for three species from the Cameroons. As stated above, these species have not been seen, but judged from the descriptions the genus is valid and the three species assigned to it form a well-defined little group.

Genus *Daraspis* gen. n.

Genotype :—*Chionaspis bussii* Newstead (figs. 9, 41).

*Diagnosis.*

Referable to the tribe Diaspidini. Body very long and narrow and all but the pygidium membranous. Pygidium rounded with three pairs of lobes. Median lobes divergent, neither zygotic nor yoked together but with a notch between, with two gland spines and a marginal macropore between the lobes; second lobes duplex, extending slightly beyond the median pair; third lobes duplex, small and inconspicuous. A pore-carrying process occurs in each interlobular space (except between the median lobes) and there are two more between the 3rd lobes and the base of the pygidium on either side. Five to seven large marginal pores occur on either side of the median lobes. Gland spines occurring singly in the usual positions except at the base of the pygidium, where there is a pair. Dorsal pores very much smaller than the marginal pores, very few in number and apparently without any regular arrangement. Dorsal pores on the prepygidial segments of a similar small size and few in number and not found anterior of the posterior spiracles. Gland tubercles wanting except marginally

of the 3rd segment, where there are two unusually large tubercles, each of which carries, usually, 3 microducts. Perivulvar pores present. Anal orifice situated near the base of the pygidium.

Scale of adult female, flat, narrowly elongate with broadly flattened margin not much broadened posteriorly, translucent pale brown with golden exuviae. Male scale brown, more or less parallel-sided and uncarinated.

*Notes.*

This genus at present contains only the type species from French Guinea. It comes closest to *Sinistraspis* MacGillivray, from which it differs in the median lobes not being yoked together, in having a marginal macropore and two gland spines between the median lobes and in lacking any asymmetrically developed characteristic.

Genus *Dentachionaspis* MacGillivray.

Genotype :—*Chionaspis capensis* Newstead, which is regarded as a synonym of *Dinaspis lounsburyi* Leonardi.

*Diagnosis.*

Referable to the tribe Diaspidini. Body fusiform with the anterior half moderately sclerotised at maturity. Pygidium broadly rounded with two pairs of lobes. Median lobes small, widely separated by a marginal notch, with scleroses arising from their bases, which are usually incompletely fused and not forming a completed yoke. Second lobes duplex with inner lobules typically much larger than the outer lobules and larger than the median lobes. Without gland spines or marginal pore between the median lobes. Gland spines of the pygidial fringe arranged singly; these are forked at the apex in the genotype but simple in the other included species. Marginal pores in the usual positions. Dorsal pores arranged in definite segmental series as far as the 5th segment; on the 6th segment the submedian group is represented by 3 to 6 pores but the submarginal group is reduced to 2 or 3 marginally. Prepygidial and metathoracic segments with groups of pores marginally and groups of gland tubercles in the normal positions. Perivulvar pores wanting in the type species. Anal orifice situated towards the base of the pygidium.

Scale of the adult female highly convex, white and moderately broadened posteriorly. Male scale small, white, uncarinated.

*Notes.*

This genus comes closest to *Inchoaspis* MacGillivray, but the species of the latter genus are very much larger—unusually large—in addition to other differences of a less striking nature.

*Dinaspis pittospori* Hall from S. Rhodesia, *Chionaspis margaritae* Brain from S. Africa, *Chionaspis pseudonivea* Malenotti from the Italian Somaliland, *Chionaspis auratilis* Newstead from Uganda and *Chionaspis ritchiei* Laing from Tanganyika and Sierra Leone are included in addition to the genotype.

*Dinaspis pittospori* differs from the genotype in the much shallower nature of the notch between the median lobes, whilst *margaritae* differs in having five well-developed groups of perivulvar pores, but despite this it appears to be more nearly congeneric with *lounsburyi* Leonardi than *pittospori*. Brain remarks (1919 : 231) that *margaritae* is very much like *Chionaspis capparisi* Brain, a species which later (: 234) he refers to as being similar to *Dinaspis lounsburyi* Leonardi in some respects. *Chionaspis capparisi* has not been seen, but it seems probable that it also should be included in this genus.

*Chionaspis pseudonivea*, like *pittospori*, has a shallow notch between the



median lobes and bears a close resemblance to it, but like *margaritae* it has five groups of perivulvar pores.

*Chionaspis auratilis* and *ritchiei* differ from the genotype and other species in having a much narrower body shape, and, although both possess certain other marked differences, they bear a sufficiently close resemblance to the genotype to be placed here until the fauna is better known. In *auratilis* the antennal tubercles are set unusually close together and immediately anterior to the rostrum, and the male scale is dull gold in colour. In *ritchiei* it is not certain that the so-called long setae of the pygidial fringe are really setae; the writer suspects that they are slender gland spines, but the capitate heads are admittedly obscure. It may be noted that most examples of this species seen exhibit a few supplementary disc pores anterior to the groups of perivulvar pores.

*Dinaspis berlesesi* Malenotti, from the Italian Somaliland, also certainly belongs to the genus *Dentachionaspis* and is very probably the same as *lounsburyi* Leonardi, but the only preparation seen—ex coll. Malenotti and bearing the data of the type material—is not sufficiently good to enable a definite opinion to be expressed.

The six included species may be separated as follows:—

- |       |  |  |
|-------|--|--|
| 1.    | Perivulvar pores present . . . . .   | 2.   |
|       | Perivulvar pores lacking . . . . .   | 4.   |
| 2(1). | Body of adult female long and narrow; pygidial gland spines replaced by long setae(?) which are more slender than is usual for gland spines but stout for setae . . . . .  | <i>ritchiei</i> Laing.                       |
|       | Body of adult female fusiform; gland spines well developed and of normal form . . . . .  | 3.   |
| 3(2). | With a deep notch between the median pygidial lobes; on the ventral aspect of both abdominal segments 4 and 5 four or five small gland tubercles, usually one pair in a submarginal and another pair in a submedian position; perivulvar pores relatively numerous, averaging, median 8, anterior laterals 21, posterior laterals 37 . . . . . | <i>margaritae</i> Brain (figs. 10, 42).      |
|       | With a shallow notch between the median lobes; gland tubercles on segments 4 and 5 lacking; perivulvar pores fewer, averaging, median 8, anterior laterals 8, posterior laterals 14 . . . . .  | <i>pseudonivea</i> Malenotti (figs. 11, 43). |
| 4(1). | Body of adult female long and narrow; antennal tubercles set unusually close together and immediately anterior to the rostrum; male scale dull gold in colour . . . . .  | <i>auratilis</i> Newstead.                   |
|       | Body of adult female fusiform; antennal tubercles not set unusually close together and normally placed; male scale white . . . . .   | 5.   |
| 5(4). | Median lobes acutely pointed, separated by a relatively deep notch; gland spines of the pygidial fringe often with forked tips . . . . .   | <i>lounsburyi</i> Leonardi.                  |
|       | Median lobes rounded, separated by a very shallow notch; gland spines simple . . . . .   | <i>pittospori</i> Hall.                      |

Genus *Dentaspis* MacGillivray.

Genotype:—*Chionaspis substriata* Newstead.

*Diagnosis.*

Referable to the tribe Diaspidini. Body small, fusiform to globose with delicate hyaline dermis. Mouthparts, typically, unusually close to the anterior margin. Anterior spiracles situated in a shallow but clearly defined pit. Pygidium broadly to very broadly rounded  
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with two pairs of lobes. Median lobes widely separated and small; in the type and two other species they are squat, broader than long with serrated apices; in two other species they are narrowly conical; second lobes in the former case duplex, of the same shape as the median pair; in the latter case single, larger than the median lobes and rounded apically. Median lobes not yoked together and without gland spines or marginal pore between them (in the type species a marginal pore is sometimes present). Gland spines of the pygidial fringe occurring singly. Dorsal pygidial pores relatively large, with short ducts either scattered or at least without any definite arrangement into series or rows. Similar pores occur marginally as far anterior as the anterior spiracles but are not numerous; gland tubercles relatively few. Perivulvar pores may or may not be present. Anal orifice situated slightly anterior of the middle of the pygidium.

Scale of adult female very highly convex, white or silvery white, often with transverse striations, rather narrow. Male scale white with or without a median carina.

#### Notes.

This genus is probably African and comes closest to *Inchoaspis* MacGillivray, but in that genus the females are unusually large, whereas in *Dentaspis* the reverse is the case.

In addition to the type four other species are included here. They are all small species in which the female scale is very highly convex and the adult female usually globose, with such delicate hyaline dermis that it is difficult to secure preparations showing the pygidial margin satisfactorily. The mouth-parts are set unusually close to the anterior margin, and this is particularly true in the cases of *substriata* and *rugosa*.

The five species fall into two groups, *substriata*, *globosus* and *rugosa* forming one and *hargreavesi* and *gibber* the other. The *substriata* group is characterised by having squat median lobes broader than long and apically serrated and duplex second lobes of similar shape. The *hargreavesi* group have conical median lobes and simple second lobes that, in the case of *hargreavesi*, are much longer than broad and more prominent than the median pair.

Despite the obvious differences between the two groups there are definite resemblances between *substriata* and *hargreavesi* on the one hand and *globosus* and *gibber* on the other which it is difficult to describe.

The five species may be separated as follows:—

1. Perivulvar pores present; median and second lobes squat, broader than long and apically serrate; second lobes duplex . . . . . 2.
- Perivulvar pores wanting; median lobes conical, second lobes conical or elongate and rounded apically, not duplex . . . . . 4.
- 2(1). Perivulvar pores restricted to the posterior lateral groups and consisting of one or two pores . . . . . *substriata* Newstead.
- Five small groups of perivulvar pores present . . . . . 3.
- 3(2). Median lobes separated by a distance equal to about three times the width of one; pygidial gland spines conical in form, much swollen at the base . . . . . *rugosa* Hall.
- Median lobes separated by a distance equal to about the width of one; pygidial gland spines not conspicuously swollen basally . . . . . *globosus* Brain (figs. 12, 44).
- 4(1). Second lobes consisting of a single prominent lobule much longer than broad and much more prominent than the median lobes, of much the same width throughout and rounded apically . . . . . *hargreavesi* Laing.
- Second lobes consisting of a single lobule little if any more prominent than the median lobes; about as broad as long, tapering, with rounded tip . . . . . *gibber* Hall.

Genus *Diaspis* Costa.

Synonymy :—*Umbaspis* MacGillivray. Genotype :—*Diaspis regularis* Newstead.

Notes.

Nine species are included in this genus, of which six have been described as new from Africa. For one of these—*regularis* Newstead—MacGillivray erected the genus *Umbaspis* on the grounds that it differed from *Diaspis* in possessing interlobal truncate lobe-like glandular projections except between the median lobes. Glandular projections in these positions are characteristic of the genus *Diaspis*, but it would be difficult to separate the African species satisfactorily on the basis of this character alone on account of the gradation from truncate to rounded exhibited by the various species. Moreover, there are no other constant differences in characters separating those species which have definitely truncated projections from those in which the projections are clearly rounded. For this reason the genus *Umbaspis* is regarded as a synonym of *Diaspis*.

Of the six species described from Africa all were originally assigned to *Diaspis*.

*D. spatulata* Hall was described as a variety of *D. subregularis* Hall, but it is now raised to specific rank in view of the fact that the flatly rounded obscurely spinose pore-carrying projection towards the base of the pygidium in *subregularis* is replaced by a conspicuous sharply sclerotised spur in *spatulata*. There are other differences that were indicated when the two forms were described.

*Diaspis africana*, *parva* and *stilosa* all of Lindinger, and *senegalensis* Vayssière, also certainly belong to this genus, but they are known only from the descriptions.

The nine included species may be separated by the following key :—

1. With a prominent marginal vasiform appendage near the base of the pygidium. Perivulvar pores absent . . . . . *helveola* Laing.
- Without such an appendage. Perivulvar pores present . . . . . 2.
- 2(1). Median lobes neither divergent nor sunken into the apex of the pygidium but projecting . . . . . *echinocacti* Bouché.
- Median lobes divergent, projecting little, if any, beyond the apex of the pygidium, with the inner margins longer than the outer and forming a definite notch . . . . . 3.
- 3(2). With a sharply pointed conspicuous sclerotised spur marginally of the 4th segment at its posterior extremity on either side . . . . . 4.
- Sharply pointed conspicuous sclerotised spur either absent or replaced by a projection of a different form . . . . . 7.
- 4(3). Pygidium with six or more large pores in a submarginal series orientated with their long axes parallel to the median longitudinal axis of the body; associated chiefly with pineapple . . . . . *bromeliae* Kerner.
- Pygidium with never more than two or three such pores . . . . . 5.
- 5(4). Lobules of the 2nd and 3rd lobes markedly dilated apically and sharply truncated . . . . . *spatulata* Hall.
- Lobules of the 2nd and 3rd lobes neither conspicuously dilated nor sharply truncated . . . . . 6.
- 6(5). Prothorax usually with well-developed lateral lobes; interlobular glandular projections apically rounded . . . . . *boisdouvalii* Signoret.
- Prothoracic lateral lobes wanting; interlobular glandular projections apically truncated . . . . . *regularis* Newstead.

- 7(3). Marginal pores considerably larger than the dorsal pores except for two large longitudinally orientated submarginal pores, one anterior to both the 2nd and 3rd lobes on each side, which are as large as the marginal pores . . . . . 8.  
 Marginal pores not strikingly larger than the dorsal pores and the two large submarginal longitudinally orientated pores not present  
*bicolor* Laing.
- 8(7). Median lobes large, much larger than the lobules of the 2nd lobes; submedian group of dorsal pores present on the 5th segment only and represented usually by a single pore . . . . . *carissae* Hall.  
 Median lobes much the same size as the lobules of the 2nd lobes; submedian groups in small groups on segments 2 to 5 both inclusive  
*subregularis* Hall.

#### Genus *Dinaspis* Leonardi.

Seventeen species have been assigned to this genus in the past. These were later reduced to 15 by sinking two names as synonyms. It is the view here that not one of these species can be correctly assigned to *Dinaspis*, and all those that have actually been seen are placed elsewhere in this paper. With the exception of *D. silvestri* Leonardi, not one exhibits the striking difference in size between the marginal pores and dorsal pores which is one of the main characteristics of *Dinaspis*. *D. silvestri*, on the other hand, has a large macropore between the median lobes and differs from typical *Dinaspis* in other respects.

The genotype of *Dinaspis* is a South American species and the genus is probably of South American origin.

#### Genus *Duplachionaspis* MacGillivray.

Three species are included in this genus, but it is with some hesitation that *ugandae* Hall has been assigned. *Chionaspis paolii* Malenotti, described from the Italian Somaliland on *Mariscus*, is certainly a *Duplachionaspis* and probably the same as *D. asparagi* (Laing & Cockerell), but the only slide available—presumably from the type lot of material as it bears identical data—is not sufficiently good to permit of a definite opinion. *Chionaspis natalensis* Maskell, described from Natal, probably also belongs here but has not been seen.

MacGillivray included 21 species in his genus, of which 11 are African, but the majority of these are clearly not congeneric with *graminis* Green, the type of the genus.

The three included species may be separated as follows :—

1. Pygidium acute; median lobes longer than broad and strongly divergent . . . . . 2.  
 Pygidium broadly rounded; median lobes squat, never longer than broad and at most only slightly divergent . . . . . *ugandae* Hall.
- 2(1). Pygidial gland spines of the interlobular spaces single, rarely in pairs; submedian groups of dorsal pores of uniform size on segments 3 to 6  
*stanotophri* Cooley (figs. 13, 45).  
 Pygidial gland spines of the interlobular spaces in pairs; submedian groups of dorsal pores on segments 3 and 4 replaced by pores of a much smaller size. . . . . *asparagi* Laing & Cockerell.

#### Genus *Epidiaspis* Cockerell.

The only species of this genus so far recorded from Africa is *E. ficifoliae* Hall. It is somewhat of a surprise to find this genus represented in Africa, as it was thought to be chiefly New World, apart from the type species, which is European.

Brain (1919 : 228) described a new species as *Diaspis* (*Epidiaspis*) *conspicua*, but this species is not even referable to the Diaspidini; it belongs to the Aspidiotine genus *Morganella* Cockerell.

#### Genus *Finaspis* gen. n.

Genotype :—*Lepidosaphes distincta* Hall.

#### *Diagnosis.*

Referable to the tribe Diaspidini. Body relatively small, elongate and narrow with parallel sides. Dermis, with the exception of the pygidium, with little evidence of sclerotisation but closely and finely striated transversely. Pygidium with a well-defined sclerotised pattern, somewhat acute with three pairs of densely sclerotised lobes. Median lobes large, tridentate, broader than long, set close together, with a small dentiform process covering the point of junction of the inner angles on the dorsal aspect. Median lobes and tissues immediately surrounding densely sclerotised. Second lobes smaller than median lobes, conical; third lobes much smaller than second lobes, but of similar shape. All lobes conspicuous on account of sclerotisation. Marginal gland spines arranged singly in the normal positions, the two towards the base of the pygidium often being dilated and bifurcate or divided apically. Marginal pores wanting with the exception of one on the 5th segment. Dorsal pores very few, small, with short ducts, scattered. Margin of free abdominal segments with a few similar pores and a few gland tubercles. Perivulvar pores in five groups. Anal orifice towards the base of the pygidium.

Scale of adult female very elongate and narrow, dull brown, exuviae terminal. Male scale much smaller than that of the female, white or dirty white, with parallel sides, uncarinated.

#### *Notes.*

This genus is difficult to place. It appears to have some affinities with *Africaspis* MacGillivray, but differs from that genus in many obvious respects as, for instance, the absence of sclerotised marginal macropores, gland spines arranged singly, and in the lack of arrangement and small size of the dorsal pores.

Lindinger (1932b : 202) assigned *L. distincta* to *Pygalataspis*, a genus erected by Ferris (1921 : 218) for a new species, *P. miscanthi*, from Formosa. This genus probably belongs to the Odonaspidini, and differs from *Finaspis* in having numerous ducts on the pygidium both dorsally and ventrally, broad toothed plates on the pygidial fringe and the absence of a small conical process between the median lobes.

At present the genus is represented by a single species described from S. Rhodesia on *Zizyphus jujuba*.

#### Genus *Fiorinia* Targioni.

*F. florinae* Targioni is fairly common throughout South Africa on *Camellia* and Palms (Brain, 1919 : 221), and it has also been recorded by Lindinger (1910 : 45) from Zanzibar on *Celtis mauritiana* and by the same author (1913 : 77) from Tanganyika on Palms.

*F. kewensis* Newstead has also been recorded from Tanganyika on *Borassus* by Lindinger (1913 : 77), but no African material of this species has been seen. There is reason to believe that this species may be of Australian origin and incorrectly assigned to *Fiorinia*, but until a comprehensive study of the species—particularly Australian—of this and allied genera has been made, it is best left where it is.

Genus *Furchadaspis* MacGillivray.

Represented by the type species only, of which *Diaspis rhusae* Brain (1919 : 225) is considered to be a synonym. *D. rhusae* was described from S. Africa on *Rhus* sp. and later was found by the author on *Cussonia spicata* in Southern Rhodesia and transferred to the genus *Furchadaspis* (Hall, 1941 : 230). *Furchadaspis zamiae* has hitherto been regarded as confined to Cycads and to *Zamia* spp. in particular. The author is unable to separate specimens from the type material of *rhusae* and *rhusae* from *Cussonia* in S. Rhodesia from *zamiae*. The principal difference between the two species was said (Hall, *loc. cit.*) to be that the two gland spines between the median lobes were simple and not bifurcated. Brain figured them as simple, but further examination of specimens from the type material shows that this is not the case; they are bifurcate or fimbriate, but this is not always apparent on account of the position in which they happen to be. Other differences are not sufficiently marked or consistent to warrant separation.

Genus *Gadaspis* gen. n.

Genotype :—*Chionaspis (Pinnaspis) combreti* Hall.

*Diagnosis.*

Referable to the tribe Diaspidini. Body elongate, fusiform, with membranous dermis. Pygidium rounded with a large and prominent pair of median lobes, rather longer than broad with their inner margins in the closest apposition. Second lobes, if present, duplex, small and dentate. Third lobes wanting. Margin of the pygidium on either side of the median lobes sometimes recessed. Marginal gland spines in the usual positions, well developed and occurring in groups of 2 to 4 spines, rarely singly. Marginal and dorsal pores of the same size. Dorsal pores arranged in rather loose series as far as the 5th segment; on the 6th segment the pores are more or less confined to the submarginal region and tend to be scattered. Similar pores occur marginally on all segments as far anterior as the mesothorax. Gland tubercles present in rather large groups in the usual positions as far as the anterior spiracles. Perivulvar pores present in five groups. Anal orifice towards the base of the pygidium.

Scale of the adult female white, moderately convex, elongate, pyriform in shape with terminal exuviae. Male scale white, parallel sided and normally uncarinated.

*Notes.*

This genus comes closest to *Pinnaspis* Cockerell and *Contigaspis* MacGillivray. From *Pinnaspis* Cockerell it differs in having large and prominent median lobes, the nature of the 2nd lobes if any, the presence of pores submarginally on segment 6 and the less regular arrangement of the dorsal pores on the segments anterior to this. From *Contigaspis* it differs in having large and prominent median lobes in the closest apposition and well-developed gland spines on the marginal fringe.

In addition to the type species two others are included to give a very well-defined and characteristic little group. They were all described from S. Rhodesia from *Combretum* and *Uapaca*. They may be separated as follows :—

1. Ventral dermis of the thoracic and anterior free abdominal segments with a few scattered tubercles carrying stout blunt processes. No trace of second lobes. Dorsal pores on the free abdominal segments confined to the marginal area . . . . . *tuberculata* Hall.

- Lacking such tubercles. Second lobes small, duplex and dentate.  
 Dorsal pores on the free abdominal segments in addition to the marginal groups distributed at irregular intervals right across the segments . . . 2.
- 2(1). With a broad and deep indentation of the margin on each side of the median lobes; gland spines of the pygidial fringe in groups of three or four . . . . . *excisa* Hall.  
 With no such conspicuous indentation; gland spines arranged in pairs . . . . . *combreti* Hall.

Genus *Genaparlatoria* MacGillivray.

Material of *G. pseudaspidotus* Lindinger has been received from the Sudan on Mango. This is believed to be the first record of this species occurring in the African continent.

Genus *Gramenaspis* MacGillivray.

This genus was erected for a single species—*Chionaspis africana* Newstead—described from South-West Africa on a “grass like” plant. Unfortunately neither the type nor any slides or material of this species have been traced. Whether the genus will prove to be valid it is impossible to say, but the characters of the type species given by Newstead seem to suggest that it may prove so.

Genus *Greenaspis* MacGillivray.

Genotype :—*Chionaspis elongata* Green.

*Diagnosis.*

Referable to the tribe Diaspidini. Body membranous with anterior extremity more flattened than rounded, extremely long and very narrow owing to the prolongation of the thoracic segments, abdominal segments short with the second and third laterally produced. Pygidium acute with two pairs of lobes. Median lobes strongly divergent and prominent, of unusual shape, with their inner edges emarginate and bases yoked together but lacking setae, gland spines or marginal pores between them. Second lobes duplex, the lobules separate, narrow with the inner much the longer. Gland spines of the pygidial fringe long and conspicuous, occurring singly in the normal positions except at the base of the pygidium, where there is a pair. Marginal and dorsal pores of the same size, the latter very few in number, in segmentally arranged rows as far as the 5th segment. Prepygidial and meta-thoracic segments with very small groups of pores and gland tubercles in the usual position. Perivulvar pores present. Anal orifice towards the base of the pygidium.

Scale of the adult female white and extremely long and narrow; male scale white, slightly broadened posteriorly.

*Notes.*

This genus resembles *Albataspis* MacGillivray, which was erected for an Australian species—*Mytilaspis nivea* Maskell—but this species is only known to the author from the original description.

The genus *Greenaspis* was erected for a Ceylon species, *C. elongata* Green, of which the Green collection contains not only the type but slides of material from India and Formosa.

*G. elongata* Green has been recorded from Italian Somaliland on *Cassine holstii* (CELASTRACEAE) by Malenotti (1915:349). This seems an unlikely host plant for *elongata*, which has previously only been known from Gramineae, chiefly Bamboo. The record is, therefore, only accepted with reserve.

Genus *Gymnaspis* Newstead.

Three species assigned to this genus have been described from Africa. One of these, *G. faureae* Brain, is not considered to be congeneric with the type on account of the fact that the pygidium of the second-stage female lacks the lobes and plates found in the genotype and other species here referred to the genus. The correct generic position of *faureae* is not clear. In the specimens available for examination, the sclerotisation of the second-stage female completely obscures the pygidial characters. There is even some doubt in the author's mind as to whether it is referable to the tribe Diaspidini at all.

Lindinger placed *G. africana* Newstead in *Cryptaspidiotus* Lindinger, a genus very close to, if not identical with, *Aonidia* Targioni. The ducts in both *africana* Newstead and *bilobis* Green & Laing are only imperfectly two-barred and it is open to question whether a second bar is present. In the larvae of the genotype—*aechmeae* Newstead—the ducts are clearly two-barred. It will be necessary to make a study of all stages of these and allied species before any definite conclusions can be reached. In the meantime the two species included may be separated as follows:—

1. Pygidium of adult female with 3 pairs of lobes; interlobular spaces with plates and in addition three plates anterior of the 3rd lobes

*africana* Newstead.

Pygidium of adult female with no more than a single pair of prominent median lobes; plates very few, small and inconspicuous, two between the median lobes and two or three immediately lateral of them on each side. . . . .

*bilobis* Green & Laing.

Genus *Howardia* Berlese & Leonardi.

The only species known from Africa is the type species—*biclavis* Comstock. Other African species that have been referred to this genus in the past are now considered to have been incorrectly placed and have been assigned to other genera in the present paper.

Genus *Hulaspis* gen. n.

Genotype:—*Howardia dombeyae* Hall (figs. 14, 46).

*Diagnosis.*

Referable to the tribe Diaspidini. Body very broadly turbinate in outline and membranous. Pygidium with a strongly marked sclerotic pattern which is sharply divided into two halves by a funnel-shaped furrow arising from the point of junction of the median lobes. A single pair of median lobes only present, the inner margins of these lobes in close apposition, except at the apical extremity, falling away laterally on either side. Each median lobe with a conspicuous sclerosis arising from its base; the two scleroses are outwardly divergent and each consists of a tube-like structure with very much thickened and sclerotised lateral margins. In the angle between the scleroses, *i.e.* between the median lobes, is a marginal pore. About 8 gland spines between the median lobe and base of the pygidium on either side; these are of uneven sizes, those towards the base being usually simple whilst those nearer the median lobes are large, often plate-like with bifurcated apices. Gland tubercles, relatively slender and not very numerous, occur as far anterior as the 1st segment. Dorsal pores with the submedian groups well separated from the submarginal groups, not numerous and more or less confined to the 2nd to 5th segments, both inclusive; the submarginal group on the 6th segment may be represented by one or two pores. Perivulvar pores lacking. Anal orifice set towards the apex of the pygidium.



Scale of adult female sub-circular, white, with brown more or less central exuviae; nymphal exuvia rather large, occupying about  $\frac{2}{3}$  of the puparium. Male scale not known.

Notes.

Only the type species known at present. This genus comes close to *Howardia*, from which it differs in having definitely zygotic median lobes, the different character of the scleroses at the base of the median lobes, and the entirely different nature and arrangement of the gland spines.

Genus *Inchoaspis* MacGillivray.

Genotype :—*Chionaspis amaniensis* Lindinger, which is a synonym of *C. dentilobis* Newstead.

Synonymy :—*Remotaspis* MacGillivray. Genotype :—*Chionaspis dentilobis* Newstead.

Diagnosis.

Referable to the tribe Diaspidini. Body large, fusiform with membranous dermis. Parastigmatic pores associated with the anterior spiracles relatively numerous. Pygidium large, broadly rounded, with marginal intersegmental indentations. Median lobes small, widely separated, not yoked together and with neither gland spines nor marginal pore between their bases. Second lobes duplex, larger than the median lobes. Third and, in the genotype, fourth lobes present. Gland spines in the usual positions varying from 0-3 per group. Dorsal pores with short ducts as far as the 5th segment in relatively well-defined series and relatively numerous; on the 6th segment they are also relatively numerous but the arrangement tends to be far less regular. Marginal pores in the normal positions and of the same size as the dorsal pores. Marginal regions of the prepygidial segments with numerous pores similar to those on the pygidium; they also occur on the thoracic segments as far as the anterior spiracles but are more widely separated; relatively large groups of gland tubercles in the normal positions. Perivulvar pores not present in the type species but present in two other species, in one of which supplementary groups occur in addition. Anal orifice towards the base of the pygidium.

Scale of the adult female white to silvery white, highly convex and broadened posteriorly when not contorted and compressed by overcrowding. Male scale white with a median carina.

Notes.

*Chionaspis dentilobis* was described by Newstead (1910:195) and *C. amaniensis* by Lindinger (1910:42). The latter author later (1913:75) sank his *amaniensis* as a synonym of *dentilobis*. MacGillivray in 1921 created two new genera *Remotaspis* with *dentilobis* Newstead as type (:311) and *Inchoaspis* with *amaniensis* Lindinger as type (:310). *Inchoaspis* has page precedence and is therefore adopted.

*Inchoaspis* comes closest to *Dentaspis* MacGillivray, but the species are much larger. Lindinger (1937:187) placed it as a synonym of *Chionaspis* Signoret, a genus to which it bears little or no resemblance at all.

Despite obvious differences, the three species here included bear such a strong resemblance to each other that it is difficult to believe they are not congeneric. They may be separated from each other as follows :—

1. With 5 groups of perivulvar pores and with supplementary groups of disc pores on the ventral dermis anterior to these; pygidial fringe without gland spines . . . . . *argentata* Hall.
- Without perivulvar pores or supplementary disc pores; pygidial fringe with gland spines in the normal positions . . . . . 2.

2. With three and sometimes four pairs of pygidial lobes, median and inner lobules of the 2nd and 3rd pairs rounded with faintly serrated edges; median lobes separated by a distance no more than twice the width of one; with no marginal pores between the median lobes; gland spines anterior of the second lobes in groups of 3; dorsal pores on segment 6 in a relatively well-defined series . . . . . *dentilobis* Newstead.
- With two pairs of lobes, median and inner lobules of the second lobes may be rounded or pointed; median lobes separated by a distance nearly four times the width of one; with 2 or 3 marginal pores between the median lobes; gland spines of the pygidial fringe occurring singly; dorsal pores on segment 6 scattered . . . . . *pygaei* Hall.

Genus *Incisaspis* MacGillivray.

This genus was erected for the reception of a single species—*Diaspis pugionifera* Lindinger—described from the Cameroons. This species has not been seen, but from the original description it seems not improbable that it may prove to represent a valid genus.

Genus *Ischnaspis* Douglas.

Four species of this genus have been described or recorded from Africa, but only two of these have been available for examination—*longirostris* Signoret and *macrolobii* Laing—which may be separated as follows:—

1. Perivulvar pores wanting, their place being taken by four transversely ovate thickenings lying in the middle of a ventral plate-like area; basal club-shaped sclerosis at the base of the inner lobule of the second lobes very slightly constricted in the middle . . . . . *macrolobii* Laing.
- Perivulvar pores present in five small groups and no ovate ventral thickenings; sclerosis at the base of the second lobe deeply constricted in the middle . . . . . *longirostris* Signoret.

Genus *Kuwanaspis* MacGillivray.

Material of *K. bambusicola* (Cockerell) on Bamboo has been received from Senegal. This species was originally described from Brazil as a *Mytilaspis*, but it has since been recorded from Algiers by Balachowsky (1928: 139) as well as from elsewhere. This author placed it in the genus *Cocco-mytilus*, but it is here considered to be referable to the genus *Kuwanaspis* as it possesses a membranous forked process between the median lobes and between the median and second lobes of the type found in that genus. Moreover, as in the case of all the known species of *Kuwanaspis*, it is associated with Bamboo.

Genus *Ledaspis* gen. n.

Genotype:—*Chionaspis (Dinaspis) mashonae* Hall.

*Diagnosis.*

Referable to the tribe Diaspidini. Body fusiform with anterior half usually more or less heavily sclerotised. Pygidium rounded with median lobes not zygotic, separated by a distinct notch but with their bases yoked; they are squat in the type species but may be prominent. Second lobes duplex, small and somewhat inconspicuous. A pair of small setae between the median lobes, but gland spines and pores wanting. Marginal pores in the usual positions; dorsal pores, of a similar size, arranged in well-defined series as far as the 5th segment; on the 6th segment they show less regular arrangement than on the preceding segments. Gland spines of the marginal fringe in the normal positions occurring singly or in pairs of unequal lengths except in one species. Prepygidial abdominal segments with

groups of gland tubercles in the usual positions. Perivulvar pores wanting. Anal orifice situated towards the base of the pygidium.

Scale of adult female pyriform, convex and white with terminal exuvia; male scale white, with subparallel sides, uncarinated or with the median carina faintly indicated.

Notes.

In addition to the genotype, *dura* Newstead, *reticulata* Malenotti, *distincta* Leonardi and *kirkiana* Hall are assigned to the genus. All five species have been found in S. Rhodesia and three of them—*dura*, *mashonae* and *kirkiana*—on *Uapaca* (EUPHORBIACEAE). *Ledaspis reticulata* is known also from Italian Somaliland and Kenya, *distincta* from S. Africa and *dura* from Uganda. This gives a wide distribution throughout eastern and southern Africa.

*Ledaspis* belongs to the group of genera of the *Phenacaspis* complex, from all of which it differs in lacking perivulvar pores. It appears to come closest to *Tecaspis*. *Ledaspis distincta* is certainly a discordant element, but fits in better here than elsewhere. The species may be said to fall into two groups. Group *distincta*, in which the gland spines of the pygidial fringe are arranged in groups of about 7 spines with the exception of the group in the 1st interlobular space, which consists of 4. The median lobes are large and prominent. Group *mashonae*, in which the corresponding groups of gland spines usually consist of 2 spines of unequal size. The median lobes are squat typically, but always smaller and less prominent than in *distincta* and of quite different form.

*Ledaspis dura* was placed by MacGillivray (1921 : 361) in *Asymmetraspis* MacGillivray, but it bears little resemblance to *distorta* Newstead, the type of that genus, and the two species are clearly not congeneric. All the five species, as well as nine others, have at various times been placed in the genus *Dinaspis*, a genus, it is now recognised, with which they have nothing to do.

Malenotti described *Dinaspis reticulata* var. *minor* from the Italian Somaliland on *Balanites somalensis*. A single slide of this species—presumably from the type material as it carries identical data—has been available, but is not sufficiently good to enable the characters to be made out satisfactorily. Some material collected on *Balanites* sp. in Kenya by Professor P. A. Buxton was typical *reticulata* Malenotti.

The five included species may be separated as follows:—

1. Sclerotised dermis of the anterior half of the body with a clearly reticulated pattern . . . . . *reticulata* Malenotti.
- Dermis lacking such reticulated dermal pattern . . . . . 2.
- 2(1). Gland spines of the pygidial fringe arranged in groups of about 7 spines with the exception of the group in the 1st interlobular space, which consists of 4. Median lobes large and prominent. Second lobes duplex, the inner lobules well developed and pointed, the outer lobules, if present, small and inconspicuous . . . . . *distincta* Leonardi.
- Never more than two spines in the corresponding groups. Median lobes often squat, broader than long, but may be prominent and relatively large. Second lobes duplex, small and inconspicuous . . . 3.
- 3(2). Median lobes prominent, about as broad as long, never definitely broader than long; dorsal pores on the 6th segment few, often absent altogether and never exceeding 6 . . . . . *dura* Newstead.
- Median lobes not prominent, squat and definitely broader than long; dorsal pores on the 6th segment always more than 6 in number . . . 4.
- 4(3). Median lobes with a conspicuous acute projection on the basal half of the inner margin; gland spines marginally of segment 4 on either side numerous—usually about 8. Female at maturity large, up to 3 mm. in length . . . . . *mashonae* Hall.

Median lobes with no conspicuous inner projection; with only 2 gland spines marginally of segment 4; female at maturity not exceeding 2 mm. in length . . . . . *kirkiana* Hall.

Genus *Lepidosaphes* Shimer.

Several African species have been referred to this genus, but only three of those that have been seen are accepted here. Two of these are well-known species of world-wide distribution, but the third, *sacchari* Hall, described from Egypt, is retained in the genus with some hesitation. Material of this species was received from Sierra Leone on *Chasmopodium caudatum* (Gramineae).

*Lepidosaphes sacchari* differs from a typical *Lepidosaphes* in not having clearly developed duplex lobes, the outer lobule being, if present at all, extremely poorly represented, in the nature of the gland spines of the marginal fringe and the widely separated median lobes.

Ferris (1941: 300) erected a genus *Nilotaspis* for the reception of *Coccomytilus halli* Green, described from Egypt, and in his notes on the new genus stated that *Lepidosaphes bicuspis* Hall, *Coccomytilus isis* Hall and *C. retamae* Hall, all described from the same country, seemed to be candidates for admission to the genus. In the opinion of the author, *bicuspis* and *isis* should be transferred to *Nilotaspis*, but *retamae* differs from the type species and the two others referred to in having the dorsal pores on the pygidium scattered, and the pores on the prepygidial segments confined to the marginal region.

*Lepidosaphes sacchari* resembles a *Nilotaspis* in some respects, but differs in having lateral spurs on the 3rd and 4th segments, a second pair of pygidial lobes and gland tubercles, rather few and small though they may be, on the prepygidial segments. This and the other four species above referred to, all described from Egypt, have undoubtedly a general resemblance and may subsequently be included in the genus *Nilotaspis* when more is known about *Lepidosaphes* and allied genera. For the time being it is considered advisable to retain *sacchari* in *Lepidosaphes*.

The three included species may be separated as follows:—

1. Prepygidial abdominal segments with secondary lobes or spurs at each anterior angle; dorsum may or may not be sclerotised but without small sclerotised bosses near the lateral margins on the 1st, 2nd and 4th abdominal segments . . . . . 2.
  - Prepygidial abdominal segments without secondary lobes or spurs at each anterior angle; dorsum not sclerotised but with small sclerotised bosses near the lateral margins on the 1st, 2nd and 4th abdominal segments . . . . . *beckii* Newman.
  - 2(1). Abdominal segments 2 to 4 with sclerotised marginal spurs at each anterior angle; dorsum of the thoracic area and 1st abdominal segment rather heavily sclerotised; gland spines between the median lobes not extending beyond the apices of the lobes; second lobes strongly duplex; gland spines at the base of the pygidium relatively long and conspicuous . . . . . *gloverii* Packard.
- Abdominal segment 2 never with a sclerotised spur, segments 3 and 4 with spurs, though sometimes small and inconspicuous, particularly on segment 3; dorsum at most with the merest trace of sclerotisation; gland spines between the median lobes long, at least twice as long as the lobes which are rather widely separated; outer lobule of second lobes, if present, very poorly developed and inconspicuous; gland spines at the base of the pygidium small and inconspicuous  
*sacchari* Hall.

Genus *Leucaspis* Targioni.

Represented by a single species—*L. cockerelli* (de Charmoy)—recorded from Tanganyika on palms by Lindinger (1913 : 79).

Genus *Marchalaspis* MacGillivray.

This genus was erected for a single species—*Chionaspis villeti* Marchal (1909 : 175)—described from French Guinea on *Copaifera guibourtiana*?. It has not been seen, but from the original description it appears to be a striking form for which the erection of a new genus was justified.

Genus *Mitulaspis* MacGillivray.

Genotype :—*Chionaspis funtumiae* Newstead.

*Diagnosis.*

Referable to the tribe Diaspidini. Body fusiform with abdominal segments 2, 3 and 4 having their lateral margins produced and each with a conspicuous spine-carrying process anteriorly. Pygidium with an elongate median sclerotised pattern, broadly rounded, with three pairs of lobes; median pair large, obconical, widely separated but not yoked, with a pair of gland spines and one or two marginal pores between them; second lobes duplex, of the same shape as the median lobes but smaller, and the outer lobule smaller than the inner; third lobes smaller, duplex but outer lobule inconspicuous. Gland spines of the second and third interlobular spaces in pairs; posterior to the third lobes there are two groups each consisting of three spines. Dorsal pores scattered, each pore encircled by a narrow band of sclerotised tissue. Marginal areas as far as the mesothoracic segment with relatively numerous pores and groups of gland tubercles in the usual positions. Perivulvar pores wanting. Anal orifice situated near the base of the pygidium.

Scale of the adult female opaque white, moderately convex, rather broadly dilated posteriorly with terminal exuviae. Male scale white, slightly wider about the middle or very narrowly pyriform, uncarinated.

*Notes.*

This genus was erected for a single species with very distinctive characters—*Chionaspis funtumiae* Newstead—described from Uganda on *Funtumia latifolia*. Recently the author was surprised to come across material of an undescribed species from Malaya on *Cinnamomum zeylanicum* that is not only congeneric with *funtumiae* but extremely close to it. It will be interesting to see if other species are discovered, and, if so, where and on what host plants.

Genus *Moraspis* gen. n.

Genotype :—*Chionaspis euphorbiae* Brain (figs. 15, 47).

*Diagnosis.*

Referable to the tribe Diaspidini. Body elongate oval and heavily sclerotised at maturity anterior to the second free abdominal segment. Pygidium broadly rounded with two pairs of inconspicuous lobes; median pair small, divergent and acutely rounded apically, with their bases clearly yoked together and a rather deep U-notch separating them; second lobes duplex, small with lobules apically rounded. Margin with a strikingly regular and more or less continuous row of marginal pores; in some places these may be two deep. Dorsal pores of the same size as the marginal pores; arranged in definite series as far as the 5th segment. Submedian and submarginal series present on the 6th segment but poorly developed. Metathoracic and free abdominal segments with irregular lines of similar pores

extending from margin to margin; in the marginal areas the pores are more numerous and scattered. Gland spines of the pygidial margin occurring singly, four in number either side of the median lobes. Gland tubercles on free abdominal segments wanting. Perivulvar pores present. Anal orifice situated towards the base of the pygidium.

Scale of adult female white, pyriform, moderately broadened posteriorly, and finely striated transversely. Male scale white and uncarinated or obscurely carinated.

#### Notes.

This genus falls within the complex of genera of the *Phenacaspis* type, which is so strongly developed in the Ethiopian region. It is characterised by the quite abnormal development of marginal pores, the lack of gland tubercles on the abdominal thoracic segments, and the extremely dense sclerotisation of the anterior two-thirds of the body.

So far only the type species, described from S. Africa on *Euphorbia*, is known.

#### Genus *Nelaspis* gen. n.

Genotype :—*Chionaspis exalbida* Cockerell.

#### Diagnosis.

Referable to the tribe Diaspidini. Body broadly fusiform with membranous dermis. Pygidium broadly rounded with rather indefinite characters. Median lobes small and inconspicuous, set well apart and neither zygotic nor yoked basally; gland spines and marginal pores between the median lobes wanting. Second lobes small, single in the type species and inconspicuous, of much the same size as the median lobes. Marginal and submarginal pores of the 6th, 5th and part of the 4th segments conspicuously larger than the dorsal pores of the submedian groups and of all pores anterior to the 4th segment. Submedian groups clearly separated from the pores of the submarginal region; the former occur as far as the 6th segment, the latter to the 5th segment only. Marginally the pores occur as far as the mesothorax. Gland tubercles apparently wanting. Pygidial gland spines, small and inconspicuous, occurring singly in the usual positions. Perivulvar pores present. Anal orifice situated about the middle of the pygidium.

Scale of adult female white, elongate, broadened posteriorly. Male scale white, with subparallel sides and a distinct median carina.

#### Notes.

This genus belongs to the group of typically Ethiopian genera in which the median lobes are small and widely set apart. It is characterised by the indefinite nature of the characters of the pygidial fringe, the well-defined submedian groups of dorsal pores of a much smaller size than those of the marginal and submarginal regions of segments 4 to 6.

In addition to the type species, *Chionaspis humilis* Brain is included. Both occur on *Aloe* and are so close that it is not easy to give satisfactory characters for their separation. Authentic material of the two species from S. Africa supports the view that, although the two are very closely allied, they are distinct. They may be separated as follows :—

1. Pygidial lobes small but clearly visible; median lobes usually strongly divergent with a shallow indentation of the margin between; second lobes duplex . . . . . *humilis* Brain (figs. 17, 49).  
 Pygidial lobes small and very inconspicuous; median lobes not strongly divergent and margin between not noticeably indented; second lobes single . . . . . *exalbida* Cockerell (figs. 16, 48).

Genus *Operculaspis* Laing.

Represented by a single species—the type species, *O. crinitus* Laing—described (1925 : 63) from Tanganyika on a forest tree. This species is of most unusual form. Laing, in erecting a new genus for its reception, regarded it as belonging to the Aspidiotini as “its affinities are entirely with such genera as *Selenaspidus* and *Pseudaonidia*.” Ferris (1937a : 5) stated that it belonged, in his opinion, to the Diaspidini rather than to the Aspidiotini, as it possessed gland spines and the ducts seemed to be more nearly of the Diaspidine than of the Aspidiotine type. The author prefers for the present to leave the question open. *Morganella longispina* (Morgan) and *M. conspicua* (Brain) both have plates or gland spines supplied by microducts, and the dorsal ducts in *O. crinitus* are at most only obscurely two-barred. In the larval form also the two enlarged ducts on the dorsal side of the head so characteristic of the larvae in Diaspidini are wanting.

Genus *Parlatoria* Targioni.

Seven species of this genus are known from the Ethiopian region. Of these five have a world-wide distribution and have almost certainly been introduced. Only two have been described from Africa : *blanchardii* Targioni from Egypt, and *fluggeae* Hall from S. Rhodesia. The first of these is now known to occur far beyond the confines of Egypt and may not be of African origin. *Parlatoria fluggeae*, described from S. Rhodesia, is not known from elsewhere at present, but as the genus appears to be Oriental in origin it is possible that even this species is not really native to Africa. Lindinger (1936 : 151) sank *fluggeae* as a synonym of *oleae* Colvee but Morrison (1939 : 15) disagreed with this view and later McKenzie (1945 : 64), in a revision of the genus *Parlatoria*, accepted *fluggeae* as a distinct species.

There is a slide labelled *Parlatoria perpusilla* Mask. in the collections of the British Museum which was presented by Prof. Cockerell and presumably determined by him. It appears from the label to have been sent to him from Natal by the late Claude Fuller. Unfortunately the preparation is in very poor condition, and as there is no other record of the species from Africa it is omitted here. It may be noted that some later workers have assigned this species to the genus *Gymnaspis* Newstead.

The seven species may be separated by the following key :—

1. Lacking gland tubercles between the anterior spiracles and margin . . . 2.
- Gland tubercles always present between the anterior spiracles and margin . . . 3.
- 2(1). With a conspicuous lobe-like protuberance of the margin opposite the anterior spiracles; 4th pygidial lobe represented by a conspicuous sclerotised spur . . . . . *zizyphi* Lucas.
- With no trace of a lobe-like protuberance; 4th pygidial lobe wanting or not clearly differentiated . . . . . *blanchardii* Targioni.
- 3(1). Fourth pygidial lobe represented by a plate similar to but smaller than those on either side of it . . . . . *proteus* Curtis.
- Fourth lobe represented by a small sclerotised spur or rudimentary tubercle; never by a plate . . . . . 4.
- 4(3). With four plates between the 3rd lobe and rudimentary tubercle representing the 4th lobe; perivulvar pores in five groups . . . *oleae* Colvee.
- With three plates between the 3rd and 4th lobes; perivulvar pores normally in four groups . . . . . 5.
- 5(4). Plates between the 3rd and 4th lobes with broad bases tapering sharply apically; pygidial lobes broad and stout . . . . . *fluggeae* Hall.

- Plates between the 3rd and 4th lobes broad throughout and apically fringed; pygidial lobes slender . . . . . 6.
- 6(5). With a small dermal pouch laterally of each posterior spiracle; dorsal pores in the submarginal region at the base of the pygidium relatively few . . . . . *camelliae* Comstock.
- With no such dermal pouch laterally of each posterior spiracle; dorsal pores in the submarginal region at the base of the pygidium relatively numerous . . . . . *pergandii* Comstock.

Genus *Phenacaspis* Cooley & Cockerell (figs. 64, 68, 72).

The genus *Phenacaspis* is recognised to be an Oriental genus, of which the principal characters are understood here to be as follows:—

The dermal tissues membranous or at least never strongly sclerotised with the exception of the pygidium. Median pygidial lobes, not prominent, longer than broad, divergent but with their bases definitely yoked together and with a notch between, causing them to appear sunken in the apex of the pygidium. The dorsal pores relatively large and arranged in regular segmentally arranged single rows interrupted to form submedian and submarginal series. The former present only to the 6th segment and the latter normally only to the 5th. Submedian series on abdominal segments 1 and 2 either wanting or very poorly developed. Perivulvar pores always present in five groups. Gland spines of the pygidial fringe arranged singly on segments 6, 7 and 8, 1 or 2 on segment 5, and 2 to 4 on segment 4.

One of the characteristics of the Ethiopian Diaspidini is the relatively high percentage of species in which the median lobes are more or less strongly yoked basally and for this reason several have been placed in the genus *Phenacaspis* in the past. In the author's opinion only two can be assigned to the genus—*dilatata* Green and *kenyae* Hall—the former being a species described from Ceylon and almost certainly introduced into Africa. Even *kenyae* differs from the genotype and is doubtfully placed because the gland spines occur in pairs in the interlobular spaces and the median lobes are not strongly divergent. The remaining 21 species fall into three more or less well-defined groups for which the genera *Rolaspis*, *Tecaspis* and *Voraspis* are erected (figs. 64–75). It is almost certain that many more species belonging to this complex of genera remain to be found in the future.

There are two slides of *P. inday* Banks in the collection of the Natural History Museum labelled 'on Date Palm leaf imported to Great Britain from South Africa', but there is no record of this species having been actually collected in S. Africa. *P. natalensis* Cockerell (1902: 25), described from Natal on Mango and recorded by Brain (1920: 100) also from Natal on Mango and Palm, is considered to be a synonym of *P. dilatata* (Green).

The two included species may be separated as follows:—

1. Median lobes strongly divergent; gland spines on segments 6, 7 and 8 arranged singly, 1 or 2 on segment 5 and usually 3 on segment 4  
*dilatata* Green (figs. 64, 68, 72).
- Median lobes not strongly divergent; gland spines on segments 6, 7 and 8 arranged in pairs, 3 on segment 5, 6 or 7 on segment 4 . . . . . *kenyae* Hall.

Genus *Pinnaspis* Cockerell.

Many Ethiopian species have been assigned to this genus in the past and not a few of them quite wrongly. Four species are included here, of which one, *aspidistræ* var. *gossypii* Newstead, is raised to specific rank on the grounds that it possesses strongly developed dorsal scleroses anterior to the anal orifice,



median lobes relatively much larger, adult female itself larger and the female scale quite different in appearance from typical *aspidistrae*. It is actually very close to *marchali* Cockerell, of which, what is believed to be authentic material from the fruits of *Elaeis guineensis* from Dahomey has been compared with part of the type material of *gossypii* Newstead. The characters of the two species under the microscope are so much alike that no constant differences have been detected by which they can be separated. The scales of the adult female are, however, quite different, those of *gossypii* are very thin semitranslucent and pale brown, whilst those of *marchali* are white, neither so thin nor so semitransparent. Whether these differences are sufficiently constant to warrant considering the two species as distinct can only be determined by a better knowledge of the species of *Pinnaspis* occurring on Cotton and *Elaeis*. For the time being they are accepted as being distinct. *P. marchali* Cockerell is very close to *P. temporaria* Ferris (1942: 407) but in the latter species the scale of the adult female is said to be opaque white.

Another species which is also obviously very close but has not been seen is *Pinnaspis proxima* Leonardi. This may possibly prove to be the same as *P. marchali* Cockerell.

*P. minor* Maskell has been recorded by several authors from the Ethiopian region, but these must be misidentifications as Maskell's species is now believed to belong to another genus. This species is not recognised from the Ethiopian region, nor has *P. minor* var. *strachani* been seen.

The four included species may be separated as follows:—

- |       |  |    |
|-------|--|----|
| 1.    | Median lobes relatively large. Dorsal scleroses anterior to the ana orifice well developed. Lateral sclerotised bands on the pygidium with two oblique bars . . . . .  | 2. |
|       | Median lobes small or very small. Dorsal scleroses wanting or poorly developed. Lateral sclerotised bands lacking oblique cross bars but sometimes the one at the posterior extremity is poorly represented . . .  | 3. |
| 2(1). | Scale of adult female white, thin, and slightly semitranslucent<br><i>marchali</i> Cockerell.<br>Scale of adult female pale brown, very thin and semitranslucent<br><i>gossypii</i> Newstead (figs. 18, 50).   |    |
| 3(1). | Median pygidial lobes not sunken; dorsal submarginal macroducts reduced in number, generally absent on the 5th segment and with one or two only on the 4th and 3rd segments; lateral extensions of metathoracic and 1st abdominal segments broadly rounded; scale of female white, very thin and translucent; male scales not known<br><i>buxi</i> Bouché.<br>Median lobes appearing sunken; dorsal submarginal macroducts more numerous with at least 2 on the 5th segment and 3 or 4 on the 4th and 3rd segments; lateral extensions of metathoracic and 1st abdominal segments acutely rounded; scale of the female brown and rather thick; male scales white, tricarinate and usually abundant<br><i>aspidistrae</i> Signoret. |    |

Genus *Potiaspis* Maskell.

The tendency has been to assign any species to this genus which possesses supplementary groups of disc pores on the ventral dermis anterior to the normal groups of perivulvar pores. The result has been that in some cases virtually the only characteristic the species have in common is the presence of the supplementary groups of disc pores. Several African species show traces of such groups, in which they may be either not represented at all or indicated by the presence

of a few pores. Lindinger (1937), on the other hand, went to the other extreme and sank *Phenacaspis* Cockerell and *Asymmetraspis*, *Cooleyaspis*, *Duplachionaspis*, *Greenaspis* and *Versiculaspis* all of MacGillivray, as well as several other genera, as synonyms of *Poliaspis*, the spelling of which he emended to *Polyaspis*. This synonymy is rejected and the view is held here that the only species referable to the genus are those in which the characters, apart from the mere presence of supplementary pore groups, are congeneric with *P. media* Maskell, the type of the genus.

Five Ethiopian species have been assigned to *Poliaspis* in the past. In the author's opinion, not one of these is congeneric with *media* Maskell nor are they congeneric between themselves. Two at least are widely different from each other and the other three. Thus *parinarii* Hall is placed in *Africaspis*, *argentata* Hall in *Inchoaspis*, *carissae* Cockerell in *Rolaspis* and *kiggelariae* Brain and *kiggelariae* var. *allophylli* Hall in *Tecaspis*. Morrison (1922 : 88) considered *kiggelariae* Brain might be included in *Poliaspis*, but in the species in question the body is heavily sclerotised whereas in typical *Poliaspis* the body is membranous.

#### Genus *Protodiaspis* Cockerell.

MacGillivray (1921 : 365) included in this genus *Chionaspis* (*Dinaspis*) *imbricata* Brain described from S. Africa on *Euclea natalensis*. This species has not been seen but it is almost certainly not referable to *Protodiaspis*. At the same time it is definitely wrongly placed in *Dinaspis*, but until the species is rediscovered it will not be possible to determine its correct generic position.

#### Genus *Pseudaulacaspis* MacGillivray.

The type species—*pentagona* Targioni—is the only representative of this genus known from the Ethiopian region. It occurs in S. Africa, S. Rhodesia, Tanganyika and Zanzibar.

#### Genus *Pseudoparlatoria* Cockerell.

Only the type species—*parlatorioides* Comstock—is known from the Ethiopian region. This was recorded by Lindinger (1910 : 46) from Tanganyika on *Aristolochia* sp.

It is strongly suspected from the description and figure that *Diaspis tricuspidata* Leonardi (1914 : 192) described from Nigeria is not only a species of *Pseudoparlatoria* but quite possibly *P. parlatorioides* Comstock.

#### Genus *Pudaspis* gen. n.

Genotype :—*Diaspis newsteadi* Leonardi (figs. 19, 51).

#### *Diagnosis.*

Referable to the tribe Diaspidini. Body circular, relatively large and membranous. Pygidium broadly rounded with a well-defined median sclerotic pattern and a single pair of large and prominent median lobes; these lobes are not zygotic but strongly sclerotised and with conspicuous inwardly directed basal sclerotisations. A pair of plate-like structures, which are shorter than the lobes, and a marginal pore present between the lobes. Immediately beyond the median lobes on either side is a similar short plate, the pygidial fringe between these plates and the base of the pygidium with several (about 15) conspicuous plate-like structures which are almost as long as the median lobes. Dorsal pores relatively small with short ducts. Submarginal and submedian groups usually well separated, the former occurring as far as the 6th segment but the latter not beyond the 5th segment.

The submarginal groups as far as the 1st segment consist of numerous pores, particularly on the free abdominal segments, and separate into two clearly defined series at a short distance from the margin. Gland tubercles, in the usual positions, relatively numerous. Perivulvar pores present in five sharply defined groups of numerous pores. Anal orifice situated towards the apex of the pygidium.

Scale of the adult female white, large, more or less circular and highly convex with subcentral sulphur-yellow exuviae. Male scale comparatively large, white, uncarinated and usually projecting away from the stem amidst a mass of fluffy white secretory matter.

#### Notes.

Only the type species at present known. This genus differs from *Diaspis* in having only a median pair of lobes, the marginal pores relatively small and no larger than the dorsal pores and the pygidial gland structure replaced by several conspicuous plate-like structures a pair of which (smaller) occur between the median lobes.

Genus **Rolaspis** gen. n. (figs. 66, 70, 74).

Genotype :—*Phenacaspis whitehilli* Hall.

#### Diagnosis.

Referable to the tribe Diaspidini. Body elongate, fusiform, often slightly sclerotised at maturity except intersegmentally. Median lobes more or less prominent, usually longer than broad with, typically, a V-shaped notch between and with their bases clearly yoked together. A pair of setae, but without gland spines or marginal pores, between the lobes. Second lobes duplex, well developed, the lobules rounded apically. Gland spines of the pygidial fringe, typically, arranged singly in the usual positions. Marginal and dorsal pores of the same size. Dorsal pores on segment 6 in a somewhat irregular submedian row, submarginal group lacking or represented by 3 or 4 pores at most, with a well-defined gap between the submedian series and submarginal group where represented. Dorsal pores on segments 1 to 5 arranged in more or less regular series and relatively numerous, especially in the marginal areas, often occurring right across segments 1 to 3, a few pores at least always present on one or more of these segments in the median area. Prepygidial and meta-thoracic segments with groups of gland tubercles in the usual positions. Perivulvar pores present in five groups. Anal orifice towards the base of the pygidium.

Scale of the adult female, white, elongate, broadened posteriorly with apical exuviae; male scale white, with apical exuvia, uncarinated.

#### Notes.

This genus differs from *Phenacaspis* in having some pores in the median region of segments 1 to 3, more numerous dorsal pores but less regularly arranged and median lobes more or less prominent and at most only slightly divergent. It differs from *Tecaspis* in the arrangement of the dorsal pores on segment 6, in having some pores in the median region of segments 1 to 3 and in having a well-developed pair of second lobes. In *Rolaspis* the median notch is generally V-shaped, the gland spines of the pygidial fringe arranged singly and the second lobes rounded apically, whereas in *Tecaspis* the median notch is generally U-shaped, the gland spines arranged in pairs and the second lobes are acute or acutely rounded.

*Rolaspis* differs from *Voraspis* in the nature of the median lobes and the arrangement of the dorsal pores.

Eight species, of which two are described below as new, in addition to the

genotype, are included in the genus *Rolaspis*. Of these *carissae* Cockerell and *munroi* differ from the genotype in having a U-shaped notch, but the shape of the notch has not been found to be a satisfactory character for generic separation. The former species also is more heavily sclerotised than is usual for the genus, whilst in the latter species the number of gland spines is more than usual. The species described as *Chionaspis chaetachmae* var. *imbricata* Hall is here raised to specific rank on the grounds that the pygidial gland spines are relatively longer, arranged singly and not in pairs, the dermis being somewhat sclerotised at maturity and in certain other respects. It is necessary, however, to give the species a new name because Brain earlier described a species *Chionaspis* (*Dinaspis*) *imbricata* from South Africa, and for that reason it is renamed here *spiculata*.

Type material of *lounsburyi* var. *ekebergiae* Brain has not been available for examination, but some material recently received on *Trichilia* sp. (MELIACEAE) from Durban has been identified as this species. *Ekebergiae* was described from specimens on *Ekebergia* sp. also belonging to the MELIACEAE from Durban. The specimens on *Trichilia* agree closely with Brain's description of *ekebergiae* and are certainly separable from *lounsburyi* Cooley, but as neither the type nor type material has been seen it is being retained as a variety. If the author's determination is correct *lounsburyi* var. *ekebergiae* is very close to *chaetachmae* also described from the same locality, and it may be that the two should be united.

The descriptions of the two new species are as follows:—

***Rolaspis compositae* sp. n. (figs. 22, 54).**

Scale of adult female silvery white, moderately convex, elongate and slender. Some individuals are more broadened posteriorly. Exuviae brown, the colour being somewhat obscured by a thin silvery white secretory film. Ventral scale thin, usually persisting along the lateral margins.

Male scale white, with parallel sides, uncarinated.

Length of scale of adult female 2.5–3.5 mm., breadth 0.8–1.0 mm.

Body of adult female elongate, fusiform, membranous with margins of abdominal segments moderately produced. Antennal tubercle more strongly developed than usual with a single curved seta which is bifid at the base. Two to four parastigmatic glands associated with the anterior spiracles. Pygidium rounded with the fringe between the 5th and 6th and between the 6th and 7th segments rather deeply indented. Median lobes slightly divergent apically, rounded and coarsely serrated with a V-shaped notch between carrying a pair of minute setae, and with their bases yoked together by a sclerotic band. Second lobes duplex, the inner lobule being of much the same size and shape as the median lobe but not serrated apically; outer lobule separated from the inner, small and sharply pointed. Gland spines of the pygidial fringe well developed, occurring singly in the normal positions. Marginal pores having capitate heads carrying short microducts. Submedian groups of dorsal pores occurring as far as the 6th segment, submarginal groups not beyond the 5th. On the 3rd, 4th and 5th segments the submedian groups consist of two parallel and regular series, the same applies to the submarginal groups but it is less well marked. Pores occur marginally of all segments as far anterior as the mesothorax. On the 1st and 2nd abdominal and the metathoracic segments scattered pores of a somewhat smaller size occur, at intervals from margin to margin. Gland tubercles in well-developed groups in the usual positions. Perivulvar pores in five groups, median 2–6, anterior laterals 10–20, posterior laterals 18–30 (average of 15 examples 4 : 16 : 24). Anal orifice towards the base of the pygidium.

On slender twigs of a Composite plant (?*Senecio*), Prince Albert, Cape Province, coll. J. C. Faure and S. H. Skaife, 17.xi.17, S.N.2483. A heavy infestation in which the scales were arranged lying more or less regularly along the twigs.

***Rolaspis munroi* sp. n. (figs. 25, 57).**

Scale of the adult female glossy white, sometimes faintly striated transversely and with extraneous matter obscuring the glossy surface; moderately convex and broadened posteriorly. Exuviae brown. Ventral scale very thin, usually remaining adherent to the host plant.

Male scale white, more or less parallel sided, uncarinated.

Length of scale of adult female 2.5–3.0 mm.; breadth 1.0–1.25 mm.

Body of adult female fusiform with dermis faintly sclerotised at maturity. Antennal tubercle with one or two curved setae; where only one is present it is bifid at the base. A loose group of some 20 to 25 parastigmatic glands associated with each anterior spiracle. Margins of free abdominal segments not strongly produced laterally. Pygidium broadly rounded. Median lobes rather squat and flatly rounded, separated by a shallow U-shaped notch about  $\frac{2}{3}$  the width of one, with a pair of small setae between and with their bases strongly yoked together. Second lobes duplex, small and inconspicuous, third lobes not clearly differentiated. Gland spines in groups of 3 to 5 spines except in the first interlobular space, where there are one or two and at the base, where there is a group of 6–8. On the ventral aspect of both segments 4 and 5 in a submarginal position is a group of about three very small gland tubercles. Marginal pores with an unusually long microduct carried by the capitate head. Dorsal pores of normal form, numerous, arranged in not very regular series and usually more or less continuous; on the 6th segment the submarginal portion of the series is generally wanting or poorly developed. Pores numerous in the marginal areas of all segments as far anterior as the mesothorax and, on abdominal segments 1 to 3, pores occur right across the segments at irregular intervals. The pores anterior to the 4th segment are rather smaller than those of the pygidium. Gland tubercles relatively numerous occur in groups in the usual positions. Perivulvar pores in five groups, median 2–7, anterior laterals 16–31, posterior laterals 25–48 (average of 16 examples 5 : 23 : 39). Anal orifice situated near the base of the pygidium.

On small twigs of native willow, Vryheid, Natal, coll. C. Fuller, 20.ix.05, No. S.N.2493 (Brain's No. 168); Kenhardt, Cape Province, coll. J. C. Faure, April 1917, S.N.2473.

This species is named after Mr. H. K. Munro, the well-known authority on the TRYPETIDAE, in recognition of his invaluable assistance in sending material of many of the S. African species dealt with in this paper.

The type specimens have been selected from the Natal material. The Cape Province material differs from that from Natal in several respects, but there does not seem to be sufficient justification to consider the forms as distinct in view of the close similarity existing between them. The Cape Province material differs in having only a small and comparatively compact group of parastigmatic pores, averaging about 5 pores, associated with the anterior spiracles, in having fewer gland spines on the pygidial fringe, the groups usually containing two and rarely more than three spines, and the series of pores on segment 6 extending much closer to the margin.

The capitate heads of the marginal pores in *munroi* carry unusually long fine microducts of the same type noted in *bauhiniae* Hall, *nigerensis* Vayssièrè and several other species. The presence of small gland tubercles on the ventral aspect of segments 4 and 5 in a submarginal position also occurs in *Denta-*

*chionaspis margaritae* (Brain) and is most strongly developed in *Versiculaspis diosmae* (Brain).

The only other species recorded from willow from Africa with which *munroi* might be confused is *Poliaspis kiggelariae* Brain, but it differs from that species in lacking the supplementary groups of disc pores, in having the tissues only faintly sclerotised at maturity, in having several gland spines in each group on the pygidial margin and in other respects.

The nine species included in *Rolaspis* may be separated by the following key:—

1. The notch between the median pygidial lobes U-shaped . . . . . 2.  
The notch between the median lobes V-shaped . . . . . 3.
- 2(1). With supplementary groups of disc pores present on the ventral dermis anterior to the normal groups of perivulvar pores; anterior portion of the body strongly sclerotised; pygidial gland spines arranged singly; notch between the median lobes relatively deep; a small species, the adult female measuring 1.0–1.25 mm. on the slide  
*carissae* Cockerell (figs. 20, 52).  
Without such supplementary groups of disc pores; anterior portion of the body only moderately sclerotised at maturity; pygidial gland spines arranged in groups of 3 to 5; notch between the median lobes relatively shallow; adult female measuring 2.0–2.50 mm.  
*munroi* sp. n. (figs. 25, 57).
- 3(1). Pygidial gland spines arranged singly . . . . . 5.  
Pygidial gland spines arranged in pairs . . . . . 4.
- 4(3). Median pygidial lobes evenly and flatly rounded, not serrated apically; anterior portion of body membranous . . . *chaetachmae* Brain (figs. 21, 53).  
Median lobes finely serrated apically; anterior portion of body faintly but clearly sclerotised at maturity  
*lounsburyi* var. *ekebergiae* Brain (figs. 24, 56).
- 5(3). Submedian groups of pores on the 3rd, 4th and 5th segments in two parallel and regular single rows; the same applies to the submarginal groups of pores but is not so clearly defined  
*compositae* sp. n. (figs. 22, 54).  
Submedian groups of pores on the 3rd, 4th and 5th segments arranged otherwise . . . . . 6.
- 6(5). Pores on abdominal segments 2 and 3 numerous, extending in a somewhat irregular but more or less evenly spaced and unbroken line right across the segments; pores of a similar size to those in the series on the pygidium  
*spiculata* new name for *chaetachmae* var. *imbricata* Hall (figs. 26, 58).  
Pores on segments 2 and 3 extending right across the segments but not numerous and rather widely and irregularly spaced over the median section; pores on segment 2, and often on segment 3, of a clearly smaller size than those of the pygidial series . . . . . 7.
- 7(6). Median lobes broader than long, squat, with indications of two or three notches on the inner margin; microducts to capitate heads of marginal pygidial pores extremely long . . . . . *leucadendri* Brain (figs. 23, 55).  
Median lobes prominent, not squat and more or less rounded apically and without notches on the inner margin; microducts of the marginal pores only moderately long . . . . . 8.
- 8(7). Body of adult female large, measuring 2.5–3.0 mm. in length and 1.2–1.4 mm. in width on the slide with correspondingly large pygidium; median lobes not serrated apically; dorsal pores relatively numerous and on segment 6 the number in the submedian series is usually 11 and rarely as few as 8 . . . . . *whitehilli* Hall (figs. 66, 70, 74).

Body of adult female smaller and narrower, measuring 1.75–2.0 mm. in length and 0.6–0.7 mm. in width on the slide with correspondingly smaller pygidium; median lobes finely serrated apically; dorsal pores fewer and on segment 6 the number in the submedian series is usually 4 and rarely as many as 8 . . . . . *lounsburyi* Cooley.

Genus *Salaspis* gen. n.

Genotype :—*Chionaspis tenuidisculus* Newstead.

*Diagnosis.*

Referable to the tribe Diaspidini. Body fusiform, much narrowed anteriorly, moderately sclerotised with a reticulated pattern. Anterior spiracles sunk in a definite shallow pit. Pygidium broadly rounded with two pairs of lobes, median lobes squat, broader than long, well separated by a shallow notch but not yoked together basally, with one or two conspicuous marginal pores between them and a pair of minute setae but no gland spines. Second lobes present, duplex, but outer lobule very small and inconspicuous. Gland spines simple, occurring singly. Marginal and dorsal pores of the same size, relatively few but rather large, surrounded by a ring of strongly sclerotic tissue, and in segmentally arranged rows except on segment 6, where the arrangement is not so definite. Marginal pores and gland tubercles on the prepygidial segments relatively few. Perivulvar pores wanting. Anal orifice towards the base of the pygidium. Medioventral area of the pygidium with several large oval longitudinally orientated vacuoles.

Scale of adult female small, convex, only slightly broadened posteriorly and flatly rounded at the posterior extremity. Male scale tricarinate.

*Notes.*

MacGillivray (1921 : 360) included *chionaspis tenuidisculus* Newstead and *C. dura* Newstead in the genus *Asymmetraspis*. The former is certainly not congeneric with *distorta*, the type of *Asymmetraspis*, nor is it congeneric with *dura*. At the same time, it probably comes closest to *Ledaspis* Hall, of which *dura* has been made the type. It differs from that genus in not having the median lobes definitely yoked together but in having a conspicuous marginal pore between them and several oval vacuoles medioventrally on the pygidium.

Genus *Scleromytilus* Hall.

This genus at present contains but a single species—*S. hargreavesi* Hall (1946 : 71)—described from Uganda on *Loranthus* sp.

Genus *Sclopetaspis* MacGillivray.

Genotype :—*Chionaspis laniger* Newstead.

*Diagnosis.*

Referable to the tribe Diaspidini. Body large, broadly fusiform with relatively short thoracic region. Anterior spiracles situated in shallow pits. Pygidium rounded, with indentations of the margin intersegmentally, with four pairs of lobes all dentate, median pair separated by a notch but not yoked and lacking gland spines or marginal pores between their bases; other lobes duplex and sharply pointed. Dorsal pores with short ducts numerous, arranged in series; on the 7th segment only the submarginal series is present, on the 6th both submedian and submarginal series are present and separate; anterior to this the series merge into one another. Large numbers of pores occur marginally of the 3rd and 4th segments, but anterior to these the pores become successively fewer as far as the anterior spiracles. Gland spines relatively small, occurring singly in the usual positions. Gland

tubercles apparently wanting. Perivulvar pores present. Anal orifice situated near the base of the pygidium.

Scale of adult female white, highly convex, broadening posteriorly, coarsely laminated transversely and with a felted woolly surface. Male scale not known.

#### Notes.

This genus at present contains only the type species. It is a genus with distinctive characters of doubtful affinities quite unlike any other recorded from the Ethiopian region.

#### Genus *Situlaspis* Ferris.

MacGillivray (1921 : 389) erected a genus *Neosignoretia* with *Aspidiotus yuccae* Cockerell as type. Ferris (1937 : 125) pointed out that *Neosignoretia* was quite erroneously referred to the Aspidiotini and united it with his *Situlaspis* in which he placed *yuccae* Cockerell. Amongst the species which MacGillivray assigned to *Neosignoretia* were *Aonidiella tectaria* (Lindinger), *Aspidiotus gowdeyi* Newstead and *Gymnaspis africana* Newstead. Only the last named belongs to the Diaspidini. It is open to some doubt as to whether it is correctly placed in *Gymnaspis* but it has certainly no resemblance to *Situlaspis*.

#### Genus *Syngenaspis* Sulc.

MacGillivray assigned all the Ethiopian species of *Parlatoria* to this genus, with the exception of *fluggeae* Hall, which had not then been described. It is doubtful if the genus *Syngenaspis* is separable from *Parlatoria*, but McKenzie (1945 : 85) recognises it with some hesitation for the type species—*parlatoriae* Sulc—only, on the basis of the difference in body shape. The genus *Syngenaspis* is not known to occur in the Ethiopian region, and the species referred to it by MacGillivray are here all placed in *Parlatoria*.

#### Genus *Tecaspis* gen. n. (figs. 67, 71, 75).

Genotype :—*Chionaspis* (*Phenacaspis*) *visci* var. *umtalii* Hall, which is here raised to specific rank.

#### Diagnosis.

Referred to the tribe Diaspidini. Body elongate, fusiform. Median lobes prominent, never appearing recessed and at most never more than slightly divergent; with their bases yoked and usually separated by a U-shaped notch. Second lobes usually present, duplex but small, acute or acutely rounded and often relatively inconspicuous. Dorsal pores arranged in regular segmentally arranged rows except on segment 6, where they are arranged in a group of more or less irregular shape, both submedian and submarginal groups being represented but not usually clearly separated. Pores numerous in the marginal and submedian regions on the prepygidial segments, but never occurring in the median area. Pygidial gland spines arranged singly in the genotype but normally in pairs. Groups of gland tubercles occurring in the usual positions. Perivulvar pores present in five groups and in addition supplementary groups may be present anterior to these. Anal orifice situated near the base of the pygidium.

Scale of adult female white, elongate, broadened posteriorly with terminal exuviae. Male scale white with terminal exuvia.

#### Notes.

*Tecaspis* comes closest to *Rolaspis*, the principal differences between the two genera being enumerated on p. 531. Eight species are assigned to the genus



in addition to the genotype. Of these the most discordant element is *sinoiae* but it is included because of the prominent nature of the median lobes, the poor development of the second lobes, which are acute apically, and the absence of dorsal pores in the median region of the prepygidial abdominal segments. *T. diplasia* Laing was originally described as a *Lepidosaphes*, but the absence of gland spines between the median lobes, the nature of the second lobes and other characteristics preclude its retention in that genus as understood here, and there seems no valid reason for excluding it from *Tecaspis*.

*Chionaspis tursioides* Laing, in the author's opinion, is the same as *C. retigera* Cockerell, and the two species should be united under the latter name. The forms described as *Poliaspis kiggelariae* var. *allophylli* Hall and *Chionaspis visci* var. *umtali* Hall are considered to be distinct species and are raised to specific rank. Preparations from cotype material of *Chionaspis mytilaspiiformis* Newstead show clearly the presence of three groups of supplementary disc pores, poorly developed though the groups may be.

The nine species included may be separated by the following key:—

1. With supplementary groups of disc pores on the ventral dermis anterior to the normal groups of perivulvar pores . . . . . 2.  
Without such supplementary groups of disc pores . . . . . 4.
- 2(1). Pygidial gland spines short, averaging 14  $\mu$ , occurring singly; anterior portion of the body strongly sclerotised at maturity; dorsal pores on the 6th segment not clearly separated into submedian and submarginal groups . . . . . *kiggelariae* Brain (figs. 27, 59).  
Pygidial gland spines arranged in pairs of spines of unequal lengths, the longer not averaging less than 20  $\mu$ ; anterior portion of the body only faintly sclerotised at maturity; dorsal pores on segment 6 may or may not be separated into submedian and submarginal groups . . . . . 3.
- 3(2). Median lobes broader than long, having a somewhat squat appearance; dorsal pores on segment 6 separated into submedian and submarginal groups; with only 3 groups of supplementary pores; second lobes, if present at all, very flatly rounded  
*mytilaspiiformis* Newstead (figs. 28, 60, 60a).  
Median lobes prominent, about as broad as long; dorsal pores on segment 6 arranged in a continuous somewhat irregular shaped group; with 5 groups of supplementary pores; second lobes acutely rounded apically . . . . . *allophylli* Hall.
- 4(1). Dorsal pores on segment 6 very few, submedian group consisting of 2 to 5 pores in a single row, submarginal group, if present at all, represented by a single pore . . . . . *sinoiae* Hall.  
Dorsal pores on segment 6 never as few . . . . . 5.
- 5(4). The sclerosis yoking the median lobes extended along the margin of the 7th segment and along part or all of the 6th . . . *visci* Brain (figs. 29, 62).  
Sclerosis yoking the median lobes not so extended . . . . . 6.
- 6(5). Pygidial gland spines short and inconspicuous; with a group of several rather large gland tubercles just posterior of each anterior spiracle  
*diplasia* Laing.  
Pygidial gland spines long and conspicuous; gland tubercles just posterior to the anterior spiracles, if present at all, represented by one or two tubercles only . . . . . 7.
- 7(6). Notch between the median lobes V-shaped, inner lobule of second lobes rounded . . . . . *subvisci* Hall.  
Notch U-shaped, inner lobule of second lobes conical . . . . . 8.
- 8(7). Pygidial gland spines arranged singly; median lobes relatively large, about 28  $\mu$  broad, rounded and finely serrated apically; group of pores

on the 6th segment and submedian group on the 5th segment clearly separated . . . . . *umtali* Hall (figs. 67, 71, 75).  
 Pygidial gland spines arranged in pairs of unequal lengths; median lobes prominent but not large, about 17  $\mu$  broad; group of pores on the 6th segment and submedian group on the 5th segment not clearly separated . . . . . *retigera* Cockerell (fig. 61).

#### Genus *Triaspidis* MacGillivray.

The type of this genus—*Lepidosaphes bicornis* Green—was described from Victoria, Australia, on *Eucalyptus*. MacGillivray, amongst several species which he assigned to the genus, included four species, all described from the Cameroons by Lindinger—*aberrans*, *crudiae*, *kamerunensis* and *meridionalis*. Unfortunately these species are only known from the original descriptions but whatever their correct generic position may be it seems clear that they are not congeneric with the genotype of *Triaspidis*.

#### Genus *Unachionaspis* MacGillivray.

The type species of this genus was described from Japan on Bamboo. MacGillivray included two S. African species in the genus, one *ambigua* Brain on Lilac, the other *globosus* Brain on *Euphorbia*. The first-named species is one of the few S. African species that has not been seen but it seems most unlikely that it is correctly assigned to *Unachionaspis*. *Chionaspis globosus* Brain, on the other hand, is certainly not referable to the genus and is here placed in *Dentaspis* MacGillivray.

#### Genus *Unaspis* MacGillivray.

Represented by a single species *U. citri* (Comstock) recorded from Sierra Leone by Laing (1929 : 480) and from French Guinea by Leonardi (1914 : 187). It is almost certainly an introduced species and, although it has been recorded from many parts of the world, is probably Oriental in origin.

#### Genus *Versiculaspis* MacGillivray.

Genotype :—*Chionaspis diosmae* Brain.

#### *Diagnosis.*

Referable to the tribe Diaspidini. Body elongate, fusiform, with faint sclerotisation of the dermis of the anterior half at maturity. Pygidium rounded, with two pairs of lobes; median lobes, separated by a conspicuous U-shaped notch, rounded apically, the base of each with an inwardly directed strongly sclerotised band, these bands are not fused and the lobes are not actually yoked at their bases; second lobes small and inconspicuous, consisting of a single apically rounded lobule. Pygidial fringe lacking gland spines. Marginal pores in the usual positions. Dorsal pores of a similar size to those of the margin, occurring in well-defined series on the 1st to 4th abdominal segments, on the 5th and 6th the normal series have supplementary parallel series containing fewer pores and on the 7th there is a submarginal group. Ventral aspect of the 5th abdominal segment with a group of some 10 unusually large and conspicuous gland tubercles, the 4th segment with a similar group, consisting of one or two large gland tubercles and several of very much smaller size; segments 3 to 1 inclusive with groups of very small gland tubercles. Perivulvar pores wanting. Anal orifice situated near the base of the pygidium.

Scale of adult female comparatively broad, moderately convex and silky in appearance with conspicuous growth lines. Male scale not known.

*Notes.*

This species falls within the complex of genera of the *Phenacaspis* type. It is characterised by the median lobes having strongly convergent basal sclerotic bands which are not fused to form a basal yoke, the development of conspicuous gland tubercles submarginally on the 5th abdominal segment replaced by tubercles of a much smaller size on the segments anterior to the 5th, the lack of pygidial gland spines and the presence of a submarginal group of pores on the 7th segment.

The presence of gland tubercles in a similar position on the 4th and 5th segments occurs in two other species—*Dentachionaspis margaritae* (Brain) and *Tecaspis munroi* Hall, both from S. Africa—but in these species they are very much smaller and less conspicuous. In other respects the three species are quite different.

*Visci* Brain has sclerotic bands at the bases of the median lobes rather similar to those found in *diosmae* but is otherwise quite different.

The genus *Versiculaspis* contains at present only the type species which was described from S. Africa on *Diosma crenata*.

Genus **Voraspis** gen. n. (figs. 65, 69, 73).

Genotype :—*Chionaspis carpenteri* Laing.

*Diagnosis.*

Referable to the tribe Diaspidini. Body elongate, fusiform. Pygidium rounded with two pairs of lobes. Median lobes small, squat, broader than long with serrated apices, separated by a marginal notch, but with their bases yoked together. A pair of setae between the lobes but without gland spines or marginal pores. Second lobes duplex, the inner lobule much larger than the outer and longer than broad. Gland spines of the pygidial fringe occurring singly. Marginal and dorsal pores of the same size. Dorsal pores in segmentally arranged rows interrupted on the 4th, 5th and 6th segments into submarginal and submedian series; the submarginal series on segment 6 reduced to 3 or 4 marginal pores. Segments 4 and 5 and sometimes 3 with a few supplementary pores arranged in irregularly parallel series. Prepygidial and thoracic segments with gland tubercles and rather numerous pores. Perivulvar pores present. Anal orifice towards the base of the pygidium.

Scale of adult female white, elongate, broadened posteriorly with terminal exuviae: male scale white, parallel sided, faintly tricarinate or uncarinate.

*Notes.*

This genus comes close to *Phenacaspis* Cockerell, from which it differs in having median lobes of characteristic squat shape and smaller dorsal pores less regularly arranged, but usually in two roughly parallel series on each segment. For the differences from *Rolaspis* and *Tecaspis*, see under *Rolaspis*, p. 531. In addition to the type species, *Chionaspis nigerensis* Vayssière (1912 : 368) described from Upper Senegal and seen on the same host plant from Nigeria, and *Phenacaspis bauhiniae* Hall (1946 : 65) described from Senegal on *Bauhinia rufescens* are here included. The type species was described from Uganda on an unknown plant. In both *nigerensis* and *bauhiniae* the marginal pores have long microducts arising from their capitate heads. These are difficult to detect except in freshly prepared well-stained specimens, and although it is suspected that the marginal pores of *carpenteri* are of similar structure it is not possible to be certain.

*Chionaspis nigerensis* and *Phenacaspis bauhiniae* are very close and the differences are mostly relative and not easily defined. The median lobes of

*P. bauhiniae* are of rather different shape and relatively closer together, the dorsal pores are fewer and the pygidial gland spines relatively longer than in *C. nigerensis*.

*Chionaspis usambarica* Lindinger (1913:76), described from Tanganyika on *Sideroxylon inerme*, would appear from the description to be closely allied to *carpenteri* and referable to this genus.

The three species may be separated as follows:—

1. Second lobes duplex with both lobules well developed and conspicuous; female scale white . . . . . *carpenteri* Laing.
- Second lobes duplex, small and inconspicuous, outer lobule if present extremely small; female scale silvery white . . . . . 2.
- 2(1). Perivulvar pores numerous, median group 10, anterior laterals 26–32, posterior laterals 30–42 . . . . . *nigerensis* Vayssière (figs. 30, 63).
- Perivulvar pores less numerous, median 2–9, anterior laterals 12–21, posterior laterals 12–26 . . . . . *bauhiniae* Hall.

KEY FOR THE SEPARATION OF THE GENERA OF DIASPIDINI RECORDED FROM THE ETHIOPIAN REGION.

1. Adult female entirely enclosed within the exuvia of the preceding stage . . . . . 2.
- Adult female not so enclosed . . . . . 5.
- 2 (1). Adult female having disc pores on one or more segments anterior to the usual perivulvar pores; body elongate; second-stage female with well-developed lobes, terminally serrated plates and macroducts . . . . . *Leucaspis* Targioni.
- Adult female with never more than the usual perivulvar pores, whether these be present or absent . . . . . 3.
- 3 (2). Adult female with the median lobes strongly divergent and separated by a deep notch but yoked together basally . . . . . *Fiorinia* Targioni.
- Adult female with the median lobes, if present, neither strongly divergent nor separated by a deep notch . . . . . 4.
- 4 (3). Pygidial margin of adult female produced into one or more long processes . . . . . *Adiscofiorinia* Targioni.
- Pygidial margin not so produced; lobes present, in the known African species, with plates in the interlobular spaces . . . . . *Gymnaspis* Newstead.
- 5 (1). Scale of the adult female always more or less circular; body of adult female circular or turbinate, never elongate except in *Aulacaspis*, where the prosoma is conspicuously swollen . . . . . 6.
- Scale of adult female of various shapes but always elongate, usually broadening posteriorly; body of adult female elongate and fusiform, pyriform or narrowly elongate in shape . . . . . 18.
- 6 (5). Body of adult female elongate with prosoma swollen, distinctly wider than the postsoma and usually quadrate in form with more or less parallel lateral margins . . . . . *Aulacaspis* Cockerell.
- Body of adult female never elongate, but usually turbinate, or more or less circular in shape . . . . . 7.
- 7 (6). Median pygidial lobes of adult female strongly zygotic . . . . . 8.
- Median lobes not zygotic . . . . . 9.
- 8 (7). With a long strongly sclerotised process arising from the base of each median lobe; other lobes wanting; perivulvar pores wanting . . . . . *Hulaspis* gen. n.
- With no such sclerotised processes; second and third pairs of lobes present, duplex but small; perivulvar pores present . . . . . *Pseudaulacaspis* MacGillivray.

- 9 (7). With a pair of either plates or gland spines between the median lobes 10.  
 Lacking plates or gland spines between the median lobes . . . . . 15.
- 10 (9). Macroducts of the pygidial margin with the axes of their orifices  
 orientated transversely and with a sclerotised rim surrounding each  
 orifice . . . . . 11.  
 Macroducts with their axes set longitudinally or diagonally and the  
 sclerotised rim, when present, similarly orientated . . . . . 12.
- 11(10). Without perivulvar pores; prosoma heavily sclerotised at maturity;  
 gland spines laterally serrate . . . . . *Genaparlatoria* MacGillivray.  
 With perivulvar pores; prosoma not sclerotised at maturity; gland  
 spines fimbriate or toothed . . . . . *Parlatoria* Targioni.
- 12(10). Median lobes well separated with a fish-tail structure between them  
 formed by a forked gland spine . . . . . *Pseudoparlatoria* Cockerell.  
 Without any such fish-tail structure . . . . . 13.
- 13(12). Median lobes prominent, not sunken and without a notch between;  
 lateral lobes wanting or reduced to minute triangular projections;  
 with a pair of conspicuous scleroses arising either from the bases of  
 the median lobes or from the angle between them . . . . . 14.  
 Median lobes sunken with a deep notch between; lateral lobes duplex,  
 well developed; scleroses lacking . . . . . *Furchadaspis* MacGillivray.
- 14(13). Perivulvar pores present in 5 large groups; scleroses short, very  
 stout and inwardly directed, arising from the bases of the median  
 lobes; gland spines of the pygidial fringe plate-like and apically  
 trifurcate, the pair between the median lobes smaller but clearly  
 developed and of the same form . . . . . **Pudaspis** gen. n.  
 Perivulvar pores wanting; scleroses long, club-shaped, divergent  
 with inner extremity knobbed, arising from the angle between the  
 median lobes; gland spines of the pygidial fringe well developed  
 and simple, the pair between the median lobes small and not clearly  
 of a glandular nature . . . . . *Howardia* Berlese et Leonardi.
- 15 (9). Without a marginal macroduct between the median lobes; anterior  
 portion of the body strongly sclerotised with a lateral thoracic projection  
 on either side; second and third lobes without any trace of division  
 into lobules; perivulvar pores wanting . . . . . *Ambigaspis* MacGillivray.  
 With a marginal macroduct between the median lobes; body mem-  
 branous, usually without any lateral thoracic lobes or projections;  
 second and third lobes, when present, clearly duplex; perivulvar  
 pores normally present. . . . . 16.
- 16(15). With a pair of small gland spines between the median pygidial lobes;  
 dorsal pygidial pores in well-arranged segmented rows as far only as  
 the 5th segment, posterior to the 5th segment only a single sub-  
 marginal pore anterior to the second lobe . . . . . *Carulaspis* MacGillivray.  
 Without such a pair of small gland spines; dorsal pores never in well-  
 arranged segmental rows, usually scattered, and may be very few,  
 and occurring as far as the 6th or 7th segments . . . . . 17.
- 17(16). Lateral lobes, if present, very poorly developed; basal scleroses of  
 the dorsal marginal setae of segments 6 and 7 rather conspicuously  
 enlarged; without conspicuous glandular tubercles on the pygidial  
 margin . . . . . *Epidiaspis* Cockerell.  
 Lateral lobes well developed and duplex; with conspicuous glandular  
 tubercles on the pygidial margin . . . . . *Diaspis* Costa.
- 18 (5). Scale of adult female small, varying considerably in form according  
 to situation; usually elongate and highly convex but may be oval  
 or even more or less circular and only low convex; body oval or  
 asymmetrical when fully developed with anterior half always more  
 or less sclerotised; median pygidial lobes clearly separated but

- with bases joined by a sclerotised band; second and third lobes, if present, poorly represented; perivulvar pores wanting . . . . . 19.
- Scale of adult female normally larger or much larger and always definitely elongate and often broadened posteriorly; body characters not in the same combination . . . . . 20.
- 19(18). Pygidial dorsal pores, though few, arranged in well-defined rows; without a marginal macropore between the median lobes; anal and genital apertures situated at the base of the pygidium  
*Asymmetraspis* MacGillivray.
- Dorsal pores not arranged clearly in rows; with a macropore between the median lobes; anal and genital apertures situated about the middle of the pygidium . . . . . *Bantudiaspis* Hall.
- 20(18). With small and inconspicuous median pygidial lobes set widely, often very widely, apart; second lobes often larger than the median lobes; median lobes may be conical, apically serrate or rounded; if a sclerotic band arises from the base of each lobe these are not usually yoked to form a definite band . . . . . 21.
- Median lobes zygotic or if not zygotic, relatively large and not set widely apart; when the lobes are relatively small and not zygotic, clearly linked by a sclerotic band; second lobes rarely larger than the median lobes . . . . . 24.
- 21(20). Submedian series of dorsal pores in well-defined groups as far as the 6th segment, the pores being of a much smaller size than those of the marginal and submarginal regions of segments 5 and 6. Characters of the pygidial fringe rather indefinite. Occurring on aloes  
*Nelaspis* gen. n.
- Dorsal pores scattered or in well-defined series, rarely in groups, never strikingly smaller than the submarginal or marginal pores . . . . . 22.
- 22(21). Body of adult female, when fully developed, unusually large with unusually large and broad pygidium; dorsal pores numerous, occurring as far as segment 6; on segment 6 the pores may or may not show some arrangement in series but on the segments anterior to this the pores are arranged in definite series *Inchoaspis* MacGillivray.
- Body of adult female not unusually large and may be quite small, with pygidium of corresponding dimensions; dorsal pores usually not numerous, those on the pygidium being either quite definitely scattered or in very definite rows. . . . . 23.
- 23(22). Dorsal pygidial pores scattered, without any definite arrangement, into rows or series; lacking a definite notch between the median lobes; body of adult female quite small, not exceeding 1.25 mm. in length and often less than 1.0 mm., frequently globose with dermis membranous and usually delicate . . . . . *Dentaspis* MacGillivray.
- Dorsal pores arranged in very regular series, submedian group on segment 6 consisting of from 2 to 6 pores in a single regular line; always with a more or less conspicuous notch between the median lobes; body of adult female of medium size, rarely as short as 1.25 mm. in length, never globose and with the anterior half moderately sclerotised at maturity . . . . . *Dentachionaspis* MacGillivray.
- 24(20). Median pygidial lobes either zygotic or with their bases definitely yoked together by a sclerotic band . . . . . 25.
- Median lobes neither zygotic nor with their bases yoked together . . . . . 38.
- 25(24). Median lobes definitely zygotic . . . . . 26.
- Median lobes not definitely zygotic but with their bases clearly yoked together by a sclerotic band . . . . . 30.
- 26(25). Median lobes with inner margins straight throughout their entire length and in close apposition . . . . . 27.

- Median lobes with their inner margins in close apposition over part only of their length or with their inner basal angles at least in close apposition . . . . . 28.
- 27(26). Median lobes small; pygidial and prepygidial macroducts confined to the margin and to a very few in the submarginal series; segment 6 with marginal macroducts only . . . . . *Pinnaspis* Cockerell.  
 Median lobes large and comparatively prominent; macroducts relatively numerous and not so confined; segment 6 always with a submarginal group of pores . . . . . **Gadaspis** gen. n.
- 28(26). Margin of the 6th and 7th segments with, in each case, 1 to 3 dentate projections associated with one or more highly sclerotised marginal macropores . . . . . *Africaspis* MacGillivray.  
 Margin of 6th and 7th segments without dentate projections associated with highly sclerotised marginal macropores . . . . . 29.
- 29(28). Median lobes only represented and these often small and inconspicuous; pygidial gland spines small and inconspicuous; dorsal pores not arranged in definite segmentally arranged rows . . . . . *Contigaspis* MacGillivray.  
 Median lobes well developed; 2nd lobes always present and usually duplex; pygidial gland spines well developed; dorsal pores arranged in definite segmentally arranged rows . . . . . *Chionaspis* Signoret.
- 30(25). With a small triangular process between the median lobes arising from the dorsal aspect of the margin. Median lobes tridentate, 2nd and 3rd lobes conical; all lobes strongly sclerotised. Dorsal pores few, small and scattered; marginal pores not occurring beyond the 5th segment. Body narrow and elongate with parallel sides . . . . . **Finaspis** gen. n.  
 With usually a well-developed U- or V-shaped notch between the median lobes but no small triangular process. Marginal pores always present as far as the 7th segment. Other characters different or not in the same combination . . . . . 31.
- 31(30). With a single median transverse group of some 14 or 15 supplementary pores ventrally anterior to the normal groups of perivulvar pores. Second lobes as large if not larger than the median lobes. Body very narrow and elongate . . . . . *Cooleyaspis* MacGillivray.  
 Without supplementary disc pores, whether perivulvar pores are present or not. When supplementary disc pores are present they are in the usual small groups and not confined to a conspicuous transverse series. Second lobes always smaller than the median lobes . . . . . 32.
- 32(31). Margin of pygidium with a practically continuous series of marginal macropores which may be two-deep in places; gland tubercles on prepygidial segments wanting. Body anterior to the 2nd abdominal segment very heavily sclerotised . . . . . **Moraspis** gen. n.  
 Margin of pygidium with normally arranged marginal macropores; gland tubercles on prepygidial segments always present. Anterior portion of the body may or may not be heavily sclerotised . . . . . 33.
- 33(32). Perivulvar pores wanting. Anterior portion of body often heavily sclerotised . . . . . **Ledaspis** gen. n.  
 Perivulvar pores present. Anterior portion of body rarely heavily sclerotised . . . . . 34.
- 34(33). Body excessively long and narrow. Median lobes prominent and strongly divergent with a conspicuous projection on the inner margin of each . . . . . *Greenaspis* MacGillivray.  
 Body never excessively long and narrow. If median lobes strongly divergent not prominent and never with a conspicuous projection on their inner margins . . . . . 35.

- 35(34). Median lobes not prominent and strongly divergent. Dorsal pores always clearly separated into submedian and submarginal groups . . . 36.  
 Median lobes prominent and not divergent, or at most only slightly so. Dorsal pores may or may not be divided into submedian and submarginal groups . . . 37.
- 36(35). Median lobes broader than long and squat; with a supplementary line of pores on segments 3, 4 and 5 in addition to the normal submedian series and anterior to them; submarginal group on segment 6 usually represented by one or two pores . . . **Voraspsis** gen. n.  
 Median lobes longer than broad; pores of submedian series on segments 3, 4 and 5 in a single regular line: submarginal group on segment 6 wanting . . . *Phenacaspis* Cockerell.
- 37(35). Segment 6 with a submedian group of pores arranged in a more or less regular line; submarginal group wanting or represented by 3 or 4 pores at most, and always with a well-marked interval between the submedian and submarginal group when present; dorsal pores distributed at irregular intervals right across the prepygidial segments; 2nd pygidial lobes well developed and rounded apically  
**Rolaspis** gen. n.  
 Dorsal pores on segment 6 more numerous, in groups or series never in a regular single line of pores; submarginal group always present but usually not clearly separated off from the submedian group; median area of the prepygidial segments without dorsal pores; 2nd pygidial lobes usually poorly developed; 2nd lobes and the usual small prominences of the margin of the 6th and 7th segments usually acute or acutely rounded . . . **Tecaspis** gen. n.
- 38(24). Margin of the pygidium with membranous, short, broad apically serrated or at least bifurcated processes, each process associated with a marginal macropore, in addition to the lobes and gland spines; a similar process and macropore occurs between the median lobes.  
 Confined to bamboos . . . *Kuwanaspis* MacGillivray.  
 Margin without such processes . . . 39.
- 39(38). With a pair of gland spines between the median lobes . . . 40.  
 Without gland spines between the median lobes . . . 47.
- 40(39). Median lobes with a marginal macropore between their bases . . . 41.  
 Median lobes without such marginal macropore . . . 43.
- 41(40). Body extremely long and narrow with parallel sides; marginally of the 3rd abdominal segment on each side with 2 enlarged gland tubercles each supplied by 3 microducts . . . **Daraspis** gen. n.  
 Body fusiform without enlarged gland tubercles marginally of the 3rd segment . . . 42.
- 42(41). Pygidial lobes somewhat obconical; gland spines arranged in groups of 2 or 3; dorsal pores relatively numerous, scattered, of much the same size as the marginal pores; perivulvar pores wanting  
*Mitulaspis* MacGillivray.  
 Pygidial lobes rounded; gland spines arranged singly; dorsal pores relatively few, scattered, of a markedly smaller size than the marginal pores; perivulvar pores present  
 one species of *Aonidomytilus* Leonardi.
- 43(40). Median lobes large, close together, with inner margins straight, diverging slightly apically before curving round to a long oblique outer margin; other lobes wanting or represented by small sharply pointed tubercles . . . 44.  
 Median lobes otherwise; 2nd lobes well developed and usually duplex; 3rd lobes often present . . . 45:
- 44(43). Entire body anterior of about the 2nd abdominal segment very



- strongly sclerotised; lateral margins of prepygidial segments with a deep indentation; perivulvar pores lacking; some of the pygidial gland spines broad, plate-like, with forked apices; bases of median lobes without conspicuous sclerotised processes. . . . *Scleromytilus* Hall.
- Anterior portion of body not sclerotised; lateral margins of prepygidial segments without a deep indentation; perivulvar pores present; pygidial gland spines simple; bases of median lobes with one or more conspicuous sclerotised processes . . . . *Andaspis* MacGillivray.
- 45(43). Body oval, margins of free abdominal segments very little produced and without spurs; gland tubercles extremely few and inconspicuous; dorsal pores in well-arranged series, but submedian groups not occurring anterior to the 3rd segment; gland spines of pygidial fringe in groups of 2 to 5 spines; perivulvar pores wanting; pygidial lobes, small, obconical in shape . . . . *Balaspis* gen. n.
- Body elongate fusiform; other characters different or not in the same combination . . . . . 46.
- 46(45). Dorsal pygidial pores, even if few, arranged in definite segmented rows or series . . . . . *Lepidosaphes* Shimer.
- Dorsal pygidial pores distributed irregularly  
some species of *Aonidomytilus* Leonardi.
- 47(39). Dorsum of pygidium with the sclerotisation forming a lattice-work pattern . . . . . *Ischnaspis* Douglas. 48.
- Pygidium without a lattice-work pattern . . . . . 48.
- 48(47). Median lobes squat with flatly rounded apically serrated margin with one or two conspicuous marginal macropores between them; ventral aspect of pygidium with irregularly arranged large oval vacuoles  
*Salaspis* gen. n.
- Median lobes of different shape, never with marginal macropores between them; pygidium without oval vacuoles . . . . . 49.
- 49(48). Dorsal pygidial pores scattered or at most in very indefinite rows  
*Unaspis* MacGillivray.
- Dorsal pores in well-defined rows or series . . . . . 50.
- 50(49). Rarely with more than a very few, if any, dorsal pores on segment 7; dorsal pores relatively few; gland spines of the pygidial fringe usually occurring in pairs . . . . . *Duplachionaspis* MacGillivray.
- With usually a large submarginal group of pores on segment 7; dorsal pores numerous; gland spines of the pygidial fringe usually occurring singly . . . . . 51.
- 51(50). With a conspicuous inwardly directed sclerotic band at the base of each median lobe; these bands are interrupted and not fused to form a yoke; with a group of relatively large gland tubercles submarginally on the ventral aspect of the 5th abdominal segment; without perivulvar pores . . . . . *Versiculaspis* MacGillivray.
- Without sclerotic bands arising from the bases of the median lobes; without a group of gland tubercles submarginally on the 5th segment; with perivulvar pores . . . . . 52.
- 52(51). With median and 3 pairs of duplex lobes; all lobes prominent, sharply pointed and with coarsely serrated lateral margins  
*Sclopetaspis* MacGillivray.
- With median and one pair of duplex lobes only; all lobes broadly rounded, relatively squat and not prominent  
*Augulaspis* MacGillivray.

## LIST OF GENERA RECORDED FROM THE ETHIOPIAN REGION.

Genus	Genotype	Author	Generic characters or figures of genotype according to Ferris	Distribution within the Ethiopian Region
<i>Adischofortinia</i>	<i>Fvortinia secreta</i> Green	Leonardi, 1906 : 17, 52	1936 : 33	Tanganyika
<i>Africaspis</i>	<i>Diaspis chionaspiformis</i> Newstead	MacGillivray, 1921 : 307	1937a : 108	Widely distributed
<i>Ambigaspis</i>	<i>Pseudonotata lucii</i> Braiin	MacGillivray, 1921 : 394	1938a : 59	S. Africa
<i>Anodaspis</i>	<i>Mitilaspis havaiensis</i> Maskell	MacGillivray, 1921 : 275	1937, No. 3	S. Africa, S. Rhodesia, Tanganyika
<i>Anomomytilus</i>	<i>Mitilaspis concolor</i> Cockerell	Leonardi, 1903 : 102	1937, Nos. 5, 7	Gold Coast, Ivory Coast, S. Rhodesia
<i>Asymmetraspis</i>	<i>Chionaspis distorta</i> Newstead	MacGillivray, 1921 : 311	—	S. Africa
<i>Auquelaspis</i>	<i>Chionaspis nudata</i> Newstead	MacGillivray, 1921 : 309	—	Tanganyika
<i>Aulacaspis</i>	<i>Aspidiotus rosce</i> Bouché	Cockerell, 1892 : 180	1937 : Nos. 9, 10	Widely distributed
<i>Balanaspis</i>	<i>Eulaspis foveat</i> sp. n.	gen. & sp. n. : 505, 506	—	S. Africa
<i>Bartulaspis</i>	<i>Howardia loranthi</i> Hall	Hall, 1941 : 225	—	S. Africa, S. Rhodesia
<i>Carulaspis</i>	<i>Aspidiotus juniperi</i> Bouché (= <i>Coccus visci</i> Schrank)	MacGillivray, 1921 : 305	1937 : Nos. 11, 12	S. Africa
<i>Chionaspis</i>	<i>Coccus salicis</i> L.	Signoret, 1869 : 442	1936 : 42, 1937 : No. 13	Belgian Congo
<i>Coccomytilus</i>	<i>Mitilaspis convezus</i> Maskell	Leonardi, 1897 : 205	1941a : 15	Not represented
<i>Conitaspis</i>	<i>Chionaspis subnudata</i> Newstead	MacGillivray, 1921 : 309	—	S. & S.W. Africa, S. Rhodesia
<i>Cooleyaspis</i>	<i>Chionaspis praelonga</i> Newstead	MacGillivray, 1921 : 308	—	Uganda
<i>Coronaspis</i>	<i>Chionaspis coronifera</i> Green	MacGillivray, 1921 : 312	1937a : 8	Not represented
<i>Crotodiaspis</i>	<i>Cryptodiaspis limuloides</i> Lindinger	MacGillivray, 1921 : 313	—	Cameroons
<i>Daraspis</i>	<i>Cryptodiaspis conservans</i> Lindinger	Lindinger, 1909 : 26	—	Cameroons
<i>Dentachionaspis</i>	<i>Chionaspis basisi</i> Newstead	gen. n. : 511	1938a : 39	French Guinea
<i>Dentaspis</i>	<i>Chionaspis capensis</i> Newstead (= <i>Dinaspis lounsburyi</i> Leonardi)	MacGillivray, 1921 : 310	—	Widely distributed
<i>Diaspis</i>	<i>Chionaspis substriata</i> Newstead	MacGillivray, 1921 : 312	1936 : 46	S. Africa, S. Rhodesia, Tanganyika, Uganda
<i>Diaspis</i>	<i>Diaspis calyptroides</i> Costa	Costa, 1928 : 7	1937 : Nos. 31, 36	Widely distributed
<i>Dinaspis</i>	(= <i>Aspidiotus echinocacti</i> Bouché)			
<i>Dinaspis</i>	<i>Dinaspis icheiti</i> Leonardi	Leonardi, 1911 : 282	1941 : No. 279	Not represented
<i>Duplichionaspis</i>	<i>Chionaspis graminis</i> Green	MacGillivray, 1921 : 307	1936 : 48, 1937 : No. 45	S. Africa, S. Rhodesia, Uganda
<i>Epidiaspis</i>	<i>Aspidiotus pircicola</i> del Guercio (= <i>Diaspis leperti</i> Signoret)	Cockerell, 1899 : 398	1937 : Nos. 49, 51	S. Rhodesia
<i>Fviaspis</i>	<i>Lepidosaphes distincta</i> Hall	gen. n. : 517	—	S. Rhodesia
<i>Fvortinia</i>	<i>Fvortinia pellicuda</i> Targioni	Targioni, 1869 : 42	1937 : Nos. 54, 55	S. Africa, Tanganyika, Zanzibar
<i>Furchadaspis</i>	(= <i>Diaspis forniae</i> Targioni)			
<i>Gadaspis</i>	<i>Diaspis zamiae</i> Morgan	MacGillivray, 1921 : 310	1937 : Nos. 58, 59	S. Africa, S. Rhodesia
<i>Genaparlatoria</i>	<i>Chionaspis (Pinnaspis) combrezi</i> Hall	gen. n. : 518	—	S. Rhodesia
<i>Gramenaspis</i>	<i>Parlatoria pseudaspidiotus</i> Lindinger	MacGillivray, 1921 : 248	1937 : Nos. 60, 61	Sudan
<i>Greenaspis</i>	<i>Chionaspis africana</i> Newstead	MacGillivray, 1921 : 309	—	S.W. Africa
<i>Greenaspis</i>	<i>Chionaspis elongata</i> Green	MacGillivray, 1921 : 307	1936 : 57	Italian Somaliland
<i>Gymnaspis</i>	<i>Gymnaspis aethiops</i> Newstead	Newstead, 1898 : 92	1937 : Nos. 62, 63	S. Africa, Tanganyika, Uganda
<i>Hemichionaspis</i>	<i>Chionaspis aspidistrae</i> Signoret	Cockerell, 1897 : 592	—	= <i>Fviaspis</i> Cockerell
<i>Howardia</i>	<i>Chionaspis biclavata</i> Comstock	Bertese et Leonardi, 1896 : 347	1937 : Nos. 64, 65	Gold Coast, San Thomé, S. Africa, S. Rhodesia

<i>Hulaspis</i>	<i>Howardia dombevae</i> Hall	gen. n. : 520	—	S. Rhodesia
<i>Inchoaspis</i>	<i>Chionaspis amancuensis</i> Lindinger (= <i>C. dentilobis</i> Newstead)	MacGillivray, 1921 : 310	—	S. Rhodesia, Tanganyika, Uganda
<i>Ichnaspis</i>	<i>Diaspis nuntioifera</i> Lindinger	MacGillivray, 1921 : 311	—	Cameroons
<i>Ichnaspis</i>	<i>Ichnaspis flisiformis</i> Douglas	Douglas, 1857 : 21	1937 : Nos. 66, 67	Widely distributed
<i>Kuonaspis</i>	(= <i>Mutillaspis longirostris</i> Signoret)	MacGillivray, 1921 : 311	1936 : 64, 1941 : No. 287	Senegal
<i>Ledaspis</i>	<i>Chionaspis hikoceni</i> Kuwana	gen. n. : 522	—	N. and S. Rhodesia, Uganda
<i>Lepidosaphes</i>	<i>Chionaspis (Diaspis) mashonae</i> Hall	Shimer, 1968 : 373	1936 : 65, 1937 : No. 70	Widely distributed
<i>Leucaspis</i>	(= <i>C. ulmi</i> L.)	Targioni, 1869 : 41	1936 : 66, 1938 : No. 147	Tanganyika
<i>Marchalaspis</i>	<i>Chionaspis weilleti</i> Marchal	MacGillivray, 1921 : 312	—	French Guinea
<i>Mutillaspis</i>	<i>Chionaspis funtuntiae</i> Newstead	MacGillivray, 1921 : 310	1936 : 69	Uganda
<i>Morasaspis</i>	<i>Chionaspis euphorbiae</i> Brain	gen. n. : 525	—	S. Rhodesia
<i>Nelaspis</i>	<i>Chionaspis exalbida</i> Cockerell	gen. n. : 526	—	S. Africa, S. Rhodesia
<i>Nesopinoretia</i>	<i>Aspidiotus nyssae</i> Cockerell	MacGillivray, 1921 : 389	1936 : 71	= <i>Sittaspis</i> MacGillivray
<i>Opeculaspis</i>	<i>Opeculaspis crivasis</i> Laing	Laing, 1925 : 63	1937a : 19	Tanganyika
<i>Parlatoria</i>	<i>Parlatoria lucasi</i> Targioni (= <i>Coccus zizyphus</i> Lucas)	Targioni, 1869 : 42	1937 : Nos. 84, 90	Widely distributed
<i>Phenacaspis</i>	<i>Chionaspis nyssae</i> Comstock	Cooley & Cockerell, 1899 : 398, note	1937 : Nos. 91, 92	Kenya, S. Africa, S. Rhodesia
<i>Pinnaspis</i>	<i>Mutillaspis parvanti</i> Comstock (= <i>Aspidiotus buzi</i> Bouché)	Cockerell, 1892 : 136	1937 : Nos. 96, 98	Widely distributed
<i>Poliaspis</i>	<i>Poliaspis media</i> Maskell	Maskell, 1879 : 293	1942 : No. 408	Not represented
<i>Pronaspis</i>	<i>Chionaspis citri</i> Comstock	MacGillivray, 1921 : 311	1936 : 78	= <i>Unaaspis</i> MacGillivray
<i>Protodiaspis</i>	<i>Protodiaspis parmula</i> Cockerell	Cockerell, 1898a : 428	1937 : Nos. 99, 105	Not represented
<i>Pseudalacaspis</i>	<i>Diaspis pentagona</i> Targioni	MacGillivray, 1921 : 305	1937 : Nos. 108, 109	S. Africa, S. Rhodesia, Tanganyika, Zanzibar
<i>Pseudoparlatoria</i>	<i>Pseudoparlatoria ostreata</i> Cockerell	Cockerell, 1892 : 136	1937 : No. 116, 1942 : No. 416	? Nigeria, Tanganyika
<i>Prudaspis</i>	<i>Diaspis newsteadi</i> Leonard	gen. n. : 530	—	S. Africa
<i>Remolaspis</i>	<i>Chionaspis dentilobis</i> Newstead	MacGillivray, 1921 : 311	1936 : 82	= <i>Inchoaspis</i> MacGillivray
<i>Rolaspis</i>	<i>Phenacaspis whitehilli</i> Hall	gen. n. : 531	—	Uganda
<i>Rolaspis</i>	<i>Chionaspis tenuisacculus</i> Newstead	gen. n. : 535	—	Uganda
<i>Scleromphalus</i>	<i>Scleromphalus hurgravesi</i> Hall	Hall, 1946 : 71	—	Uganda
<i>Scleromphalus</i>	<i>Chionaspis laniger</i> Newstead	MacGillivray, 1921 : 307	1937a : 117	Uganda
<i>Sittulaspis</i>	<i>Pseudodiaspis condaliae</i> Ferris	Ferris, 1957 : 120	1937 : Nos. 120, 122	Not represented
<i>Synganaspis</i>	<i>Synganaspis parlatoriae</i> Sulc	Sulc, 1895 : 2, 15	1937a : 118	Not represented
<i>Tecaspis</i>	<i>Chionaspis (Phenacaspis) visci</i> var. <i>umtatii</i> Hall	gen. n. : 536	—	S. and S.W. Africa, S. Rhodesia, Tan- ganyika
<i>Triaspitis</i>	<i>Lepidosaphes bicornis</i> Green	MacGillivray, 1921 : 273	1937a : 29	Not represented
<i>Umaaspis</i>	<i>Diaspis regularis</i> Newstead	MacGillivray, 1921 : 306	1937a : 119	= <i>Diaspis</i> Costa
<i>Unachionaspis</i>	<i>Chionaspis colemani</i> Kuwana (= <i>Florinia signata</i> Maskell)	MacGillivray, 1921 : 307	1936 : 90	Not represented
<i>Unaaspis</i>	<i>Chionaspis acuminata</i> Green	MacGillivray, 1921 : 308	1936 : 91	French Guinea, S. Africa, Sierra Leone
<i>Versiculaspis</i>	<i>Chionaspis atiosmae</i> Brain	MacGillivray, 1921 : 312	1938a : 64	S. Africa
<i>Voraspiis</i>	<i>Chionaspis carpenteri</i> Laing	gen. n. : 539	—	Nigeria, Senegal, Uganda

## LIST OF SPECIES RECORDED FROM THE ETHIOPIAN REGION.

Species name	Generic name	Author	Reference	Distribution records	Generic assignment by MacGillivray	Generic assignment adopted here
<i>aberrans</i>	<i>Lepidosaphes</i>	Lindinger	1909 : 83	Cameroons	<i>Triaspis</i>	Indeterminate
<i>africana</i>	<i>Chionaspis</i>	Newstead	1912 : 19	S. W. Africa	<i>Grammaspis</i>	Type of <i>Grammaspis</i>
<i>africana</i>	<i>Diaspis</i>	Lindinger	1909 : 82	Cameroons	<i>Diaspis</i>	Apparently a <i>Diaspis</i>
<i>albans</i>	<i>Gymnaspis</i>	Newstead	1913 : 78	Tanganyika, Uganda	<i>Xenosporozelia</i>	<i>Gymnaspis</i>
<i>alophylli</i>	<i>Mytilaspis</i>	Cockerell	1893 : 156	Gold Coast, Ivory Coast	<i>Coccomytilus</i>	<i>Aonidomytilus</i>
<i>amanensis</i>	<i>Chionaspis (Poliaspis)</i>	Hall	1929 : 374	S. Rhodesia	—	Type of <i>Inchoaspis</i>
<i>ambiguus</i>	<i>Chionaspis</i>	Lindinger	1910 : 42	S. Rhodesia	<i>Inchoaspis</i>	= <i>Remotaspis dentilobis</i>
<i>argentina</i>	<i>Chionaspis</i>	Brain	1920 : 97	S. Africa	<i>Unactionspis</i>	Indeterminate
<i>asparagi</i>	<i>Potiaspis</i>	Hall	1941 : 231	S. Rhodesia	—	<i>Inchoaspis</i>
<i>aspidistrae</i>	<i>Chionaspis</i>	Laing & Cockerell	1929 : 1	San Thomé, S. Africa, Tanganyika	<i>Hemichionaspis</i>	<i>Duplichionaspis</i>
<i>aspidistrae gossypii</i>	<i>Chionaspis</i>	Signoret	1869 : 449	—	—	<i>Pinnaspis</i>
<i>auratilis</i>	<i>Hemichionaspis</i>	Newstead	1908 : 87	Uganda	—	= <i>Pinnaspis gossypii</i>
<i>bambusicola</i>	<i>Chionaspis</i>	Newstead	1920 : 204	Senegal	<i>Coronaspis</i>	<i>Dentachionaspis</i>
<i>baphatae</i>	<i>Mytilaspis</i>	Cockerell	1898 : 44	Senegal	<i>Coccomytilus</i>	<i>Kuvonaspis</i>
<i>bauhiniae</i>	<i>Africaspis</i>	Hall	1943 : F	S. Rhodesia	—	<i>Africaspis</i>
<i>beckii</i>	<i>Pinnaspis</i>	Hall	1946 : 65	Senegal	—	<i>Voraspi</i>
<i>berlesii</i>	<i>Coccus</i>	Newman	1869 : 217	Widely distributed	<i>Lepidosaphes</i>	Certainly a <i>Dentachionaspis</i> ;
<i>berlesii</i>	<i>Dynaspis</i>	Malenotti	1916 : 347	Italian Somaliland	—	probably <i>D. founsburyi</i>
<i>berliniae</i>	<i>Chionaspis (Pinnaspis)</i>	Hall	1928 : 285	S. Rhodesia	—	<i>Africaspis</i>
<i>bidavis</i>	<i>Chionaspis</i>	Comstock	1883 : 98	Gold Coast, San Thomé, S. Africa, S. Rhodesia	<i>Honoriella</i>	<i>Honoriella</i>
<i>bicolor</i>	<i>Diaspis</i>	Laing	1932 : 63	Belgian Congo	—	<i>Diaspis</i>
<i>bilobis</i>	<i>Gymnaspis</i>	Green & Laing	1923 : 130	Tanganyika	—	<i>Gymnaspis</i>
<i>bispadensis</i>	<i>Ichmaspis</i>	Lindinger	1909 : 82	Cameroons, French Guinea	<i>Ichmaspis</i>	Apparently an <i>Ichmaspis</i>
<i>blanchardii</i>	<i>Coccus</i>	Fargioni	1869 : 82	Italian Somaliland	<i>Pariatoria</i>	<i>Pariatoria</i>
<i>boissaudii</i>	<i>Diaspis</i>	Signoret	1869 : 432	Belgian Congo, S. Africa, S. Rhodesia	<i>Diaspis</i>	<i>Diaspis</i>
<i>brachylegatae</i>	<i>Lepidosaphes</i>	Hall	1928 : 276	Senegal	—	<i>Aonidomytilus</i>
<i>brunneatae</i>	<i>Coccus</i>	Kerner	1778 : 20, 52	S. Rhodesia	<i>Diaspis</i>	<i>Diaspis</i>
<i>buasi</i>	<i>Chionaspis</i>	Newstead	1914 : 171	French Guinea	<i>Pinnaspis</i>	Type of <i>Derraspis</i> gen. n.
<i>buasi</i>	<i>Aspidiotus</i>	Bouché	1851 : 111	Cameroons, Gold Coast, Tanganyika	<i>Pinnaspis</i>	<i>Pinnaspis</i>
<i>caeli</i>	<i>Diaspis</i>	Comstock	1883 : 91	S. Africa	<i>Diaspis</i>	= <i>Diaspis ethiopiacti</i>
<i>caffa</i>	<i>Chionaspis</i>	Brain	1920 : 87	S. Africa	<i>Duplichionaspis</i>	<i>Africaspis</i>
<i>caulanthina</i>	<i>Pariatoria</i>	Bertess et Leonard	1902 : 346	—	<i>Syracaspis</i>	= <i>Pariatoria oleae</i>
<i>calyptroides</i>	<i>Diaspis</i>	Costa	1892 : 20	—	<i>Diaspis</i>	= <i>Diaspis ethiopiacti</i>
<i>camellatae</i>	<i>Pariatoria</i>	Comstock	1883 : 74	Belgian Congo, French Guinea	<i>Pariatoria</i>	<i>Pariatoria</i>
<i>capensis</i>	<i>Chionaspis</i>	Newstead	1917 : 378	—	<i>Dentachionaspis</i>	Type of <i>Dentachionaspis</i>
<i>capparisi</i>	<i>Chionaspis</i>	Brain	1919 : 223	S. Africa	<i>Duplichionaspis</i>	= <i>Diaspis founsburyi</i>
<i>carissae</i>	<i>Diaspis</i>	Hall	1928 : 278	S. Rhodesia	<i>Diaspis</i>	<i>Diaspis</i>
<i>carissae</i>	<i>Chionaspis (Poliaspis)</i>	Cockerell	1902 : 119	S. Africa	<i>Potiaspis</i>	Probably a <i>Dentachionaspis</i>
<i>carpenteri</i>	<i>Chionaspis</i>	Laing	1929 : 481	Uganda	—	<i>Diaspis</i>
<i>castellii</i>	<i>Diaspis</i>	Tardoni	1869 : 43	—	<i>Carrulaspis</i>	Type of <i>Voraspi</i> gen. n.
<i>castellii</i>	<i>Chionaspis</i>	Newstead	1911 : 89	—	<i>Africaspis</i>	= <i>Africaspis chionaspiformis</i>
<i>chaetachmae</i>	<i>Chionaspis</i>	Brain	1919 : 235	S. Africa, S. Rhodesia	<i>Duplichionaspis</i>	<i>Rotaspis</i>

* <i>chaedachmae imbricata</i>	Hall	1929 : 364	Nyasaland, Port E. Africa, S. Africa, S. Rhodesia, Tanganyika, Uganda	—	—	= <i>Rolaspis spiculata</i> (nom. nov.) Type of <i>Africaspis</i>
* <i>chionaspiformis</i>	Newstead	1910 : 198	S. Rhodesia	<i>Africaspis</i>		
* <i>chitpingae chitinosus</i>	Hall Lindinger	1941 : 223 1909 : 34	Cameroon, S. Africa	<i>Coccomytilus</i>		<i>Africaspis</i> Indeterminate, not <i>Coccomytilus</i>
* <i>cinnamomi</i>	Newstead	1908 : 34	Gold Coast, Kenya, S. Africa, S. Rhodesia	<i>Aulacaspis</i>		= <i>Aulacaspis cinnamomi</i>
* <i>cinnamomi mangiferae</i>	Newstead	1911 : 86		<i>Aulacaspis</i>		<i>Unaspis</i>
* <i>citri</i>	Comstock	1883 : 100	French Guinea, Sierra Leone, S. Africa	<i>Prontaspis</i>		
* <i>citricola</i>	Packard	1869 : 527		<i>Leucaspis</i>		= <i>Lepidosaphes beckii</i>
* <i>cockerelli</i>	de Charmoy	1899 : 33	Tanganyika	—		<i>Leucaspis</i> Type of <i>Gadaspis</i>
* <i>combrati</i>	Hall	1928 : 283	S. Rhodesia	—		<i>Africaspis</i>
* <i>communis</i>	Hall	1928 : 284	S. Africa, S. Rhodesia	—		= <i>Africaspis berliniae</i>
* <i>communis berliniae</i>	Hall	1928 : 285		—		= <i>Africaspis dioispyros</i>
* <i>communis dioispyros</i>	Hall	1929 : 365		—		= <i>Africaspis chionaspiformis</i>
* <i>communis monotes</i>	Hall	1928 : 286		—		<i>Rolaspis</i>
* <i>compositae</i>	sp. n.	: 532	S. Africa	—		Type of <i>Cryptodiaspis</i>
* <i>conservans</i>	Lindinger	1909 : 26	Cameroon	<i>Cryptodiaspis</i>		= <i>Morganella conspecta</i>
* <i>conspicua</i>	Brain	1919 : 298		<i>Chortzaepidiotus</i>		( <i>Aspidiotini</i> )
* <i>cravoi fulleri</i>	Cockerell	1901 : 225	Tanganyika	<i>Pseudaulacaspis</i>		= <i>Aulacaspis fulleri</i>
* <i>crinitus</i>	Laing	1925 : 63	Cameroon	—		Type of <i>Operculaspis</i>
* <i>crudiae</i>	Lindinger	1909 : 35		<i>Triaspis</i>		Indeterminate, not <i>Triaspis</i>
* <i>cyanogena</i>	Cockerell	1901 : 226	S. Africa	—		<i>dis</i>
* <i>denticollis</i>	Newstead	1910 : 195	S. Africa, Tanganyika, Uganda	<i>Hemichionaspis</i>		<i>Contigaspis</i>
* <i>atlalata</i>	Green	1899 : 148	S. Rhodesia, Tanganyika, Uganda	<i>Remotaspis</i>		<i>Inchoaspis</i>
* <i>dioemae</i>	Brain	1920 : 101	S. Africa, S. Rhodesia	<i>Phenacaspis</i>		<i>Phenacaspis</i>
* <i>dioispyros</i>	Hall	1929 : 365	S. Africa	<i>Verstucalaspis</i>		Type of <i>Verstucalaspis</i>
* <i>diplosia</i>	Laing	1925 : 65	S. Rhodesia	<i>Africaspis</i>		<i>Africaspis</i>
* <i>dispar</i>	Vayssière	1913 : 124	Tanganyika	—		<i>Tecaspis</i>
* <i>distincta</i>	Leonardi	1914 : 213	S. Africa, S. Rhodesia	—		= <i>Aonidomytilus albus</i>
* <i>distincta</i>	Hall	1929 : 375	S. Rhodesia	—		Type of <i>Finaspis</i> gen. n.
* <i>distorta</i>	Leonardi	1917 : 377	S. Africa	—		Type of <i>Asymmetraspis</i>
* <i>distorta</i>	Newstead	1929 : 360	S. Rhodesia, Uganda	—		Type of <i>Hulaspis</i> gen. n.
* <i>dombegae</i>	Hall	1920 : 205	S. Rhodesia	<i>Asymmetraspis</i>		<i>Ledaspis</i>
* <i>dura</i>	Newstead	1883 : 53	S. Africa	<i>Asymmetraspis</i>		<i>Ledaspis</i>
* <i>echinocacti</i>	Bouché	1899 : 125	Italian Somaliland	<i>Diaspis</i>		Type of <i>Greenaspis</i>
* <i>elongata</i>	Green	1919 : 234	S. Africa, S. Rhodesia	<i>Greenaspis</i>		Type of <i>Moraspis</i> gen. n.
* <i>exphorbiae</i>	Brain	1902 : 112	S. Rhodesia	<i>Duplacionaspis</i>		Type of <i>Nelaspis</i> gen. n.
* <i>exhibida</i>	Cockerell	1929 : 366	S. Rhodesia	<i>Duplacionaspis</i>		<i>Gadaspis</i>
* <i>eccisa</i>	Hall	1941 : 226	S. Rhodesia	—		<i>Bantudiaspis</i>
* <i>faureae</i>	gen. n. and sp. n.	: 506	S. Africa	—		Type of <i>Balaspis</i> gen. n.
* <i>faurei</i>	Brain	1919 : 218	S. Africa	—		Indeterminate
* <i>faurei</i>	Newstead	1917 : 379	Kenya, S. Rhodesia	<i>Duplacionaspis</i>		<i>Africaspis</i>
* <i>ficifoliae</i>	Hall	1941 : 228	S. Rhodesia	—		<i>Epidiaspis</i>
* <i>ficifoliae</i>	Leonardi	1913 : 35	Eritrea	—		Indeterminate, not <i>Lepidosaphes</i>
* <i>florinae</i>	Targioni	1887 : 14	S. Africa, Tanganyika, Zanzibar	<i>Fiorinia</i>		<i>Fiorinia</i>

LIST OF SPECIES RECORDED FROM THE ETHIOPIAN REGION—continued.

Species name	Generic name	Author	Reference	Distribution records	Generic assign- ment by MacGillivray	Generic assignment adopted here
<i>flava hawoniensis</i>	<i>Mylasaspis</i>	Maskell	1894 : 47	S. Rhodesia	—	= <i>Andasaspis hawoniensis</i>
* <i>fulgurea</i>	<i>Parlataria</i>	Hall	1929 : 359	S. Africa	—	<i>Parlataria</i>
* <i>fulleri</i>	<i>Diaspis</i>	Cockerell	1901 : 225	Uganda	<i>Pseudomulacaspis</i>	<i>Aulacaspis</i>
* <i>turkuminae</i>	<i>Chionaspis</i> ( <i>Dinaspis</i> )	Newstead	1914 : 310	S. Rhodesia	<i>Mitulaspis</i>	Type of <i>Mitulaspis</i>
* <i>vibber giffardi</i>	<i>Dinaspis</i>	Hall	1929 : 372	S. Rhodesia	—	<i>Dentaspis</i>
* <i>gibber giffardi</i>	<i>Dinaspis</i>	Leonardi	1914 : 215	French Guinea	—	Indeterminate, not <i>Dinaspis</i>
* <i>gibbosus</i>	<i>Chionaspis</i>	Brain	1919 : 236	S. Africa	<i>Unachionaspis</i>	<i>Dentaspis</i>
* <i>gloverii</i>	<i>Coccus</i>	Packard	1869 : 527	San Thomé, Sierra Leone, S. Africa, Tanganyika, Uganda	<i>Lepidosaphes</i>	<i>Lepidosaphes</i>
* <i>rossiipii</i>	<i>Hemichionaspis</i>	Newstead	1908 : 37	Togo	—	<i>Pinnaspis</i>
* <i>hamata</i>	<i>Diaspis</i> ( <i>Cryptodiaspis</i> )	Lindinger	1900 : 28	Cameroon	<i>Cryptodiaspis</i>	<i>Cryptodiaspis</i>
* <i>harrenvessi</i>	<i>Chionaspis</i>	Laing	1925 : 61	Uganda	—	<i>Dentaspis</i>
* <i>harrenvessi</i>	<i>Scleromutilus</i>	Hall	1946 : 71	Uganda	—	Type of <i>Scleromutilus</i>
* <i>hawaiiensis</i>	<i>Mylasaspis</i>	Maskell	1894 : 47	S. Africa, S. Rhodesia	<i>Andaspis</i>	Type of <i>Andaspis</i>
* <i>helvola</i>	<i>Diaspis</i>	Laing	1932 : 65	Belgian Congo	—	<i>Diaspis</i>
* <i>herbae</i>	<i>Chionaspis</i>	Green	1899 : 132	S. Rhodesia	<i>Chionaspis</i>	<i>Aulacaspis</i>
* <i>humilis</i>	<i>Chionaspis</i>	Brain	1919 : 231	S. Africa	<i>Phenacaspis</i>	<i>Xelaspis</i>
* <i>imbricata</i>	<i>Chionaspis</i> ( <i>Dinaspis</i> )	Brain	1920 : 100	S. Africa	<i>Protodiaspis</i>	Indeterminate, not <i>Protodiaspis</i>
* <i>inday</i>	<i>Chionaspis</i>	Banks	1906 : 222, 232, 737	S. Africa	<i>Phenacaspis</i>	<i>Phenacaspis</i>
* <i>indigiferiae kamerunensis</i>	<i>Chionaspis</i> ( <i>Pinnaspis</i> )	Hall	1928 : 286	S. Africa, S. Rhodesia	—	<i>Contiaspis</i>
* <i>kenyas</i>	<i>Lepidosaphes</i>	Lindinger	1909 : 37	Cameroon, French Guinea	<i>Triaspis</i>	Indeterminate, not <i>Triaspis</i>
* <i>kenyas</i>	<i>Phenacaspis</i>	Hall	1946 : 66	Kenya	—	<i>Phenacaspis</i>
* <i>sigalariarum</i>	<i>Fiortina</i>	Newstead	1901 : 82	Tanganyika	<i>Adiscofortina</i>	<i>Fiortina</i>
* <i>sigalariarum allo-</i>	<i>Chionaspis</i> ( <i>Poliaspis</i> )	Brain	1919 : 238	S. Africa	<i>Poliaspis</i>	<i>Tecaspis</i>
* <i>sigalariarum allo-</i>	<i>Chionaspis</i> ( <i>Poliaspis</i> )	Hall	1929 : 374	S. Africa	—	= <i>Tecaspis allophylli</i>
* <i>birkiniae</i>	<i>Dinaspis</i>	Hall	1941 : 227	S. Rhodesia	—	<i>Ledaspis</i>
* <i>laniger</i>	<i>Chionaspis</i>	Newstead	1920 : 206	Uganda	<i>Sclopelaspis</i>	Type of <i>Sclopelaspis</i>
* <i>leucandri timoloides</i>	<i>Chionaspis</i>	Brain	1920 : 98	S. Africa	<i>Dyplachionaspis</i>	<i>Rolaspis</i>
* <i>longirostris</i>	<i>Diaspis</i> ( <i>Cryptodiaspis</i> )	Lindinger	1909 : 30	Cameroon	<i>Credodiaspis</i>	Type of <i>Credodiaspis</i>
* <i>loranthi</i>	<i>Mylasaspis</i>	Sigoret	1882 : xxxv	Widely distributed	<i>Ichnaspis</i>	<i>Ichnaspis</i>
* <i>lonsburii</i>	<i>Hemardia</i>	Hall	1928 : 279	S. Africa, S. Rhodesia	—	Type of <i>Hemardiaspis</i>
* <i>lonsburii</i>	<i>Dinaspis</i>	Leonardi	1914 : 216	S. Africa, S. Rhodesia	—	<i>Dentachionaspis</i>
* <i>lonsburii</i>	<i>Chionaspis</i>	Cooley	1898 : 87	S. Africa	—	<i>Rolaspis</i>
* <i>lonsburii akoberinae</i>	<i>Chionaspis</i> ( <i>Phenacaspis</i> )	Brain	1920 : 99	S. Africa	<i>Phenacaspis</i>	<i>Rolaspis</i>
* <i>lutea</i>	<i>Chionaspis</i>	Newstead	1911a : 169	Gold Coast, Sierra Leone, Tan- ganyika	<i>Phenacaspis</i>	" <i>Chionaspis</i> ," see p. 508.
* <i>lycia</i>	<i>Pseudomutua</i>	Brain	1919 : 210	S. Africa	<i>Ambiagaspis</i>	Type of <i>Ambiagaspis</i>
* <i>maculobis</i>	<i>Ichnaspis</i>	Laing	1932 : 67	Belgian Congo	—	<i>Ichnaspis</i>
* <i>maduensis</i>	<i>Chionaspis</i>	Zehntner	1898 : 1	Uganda	<i>Sclopelaspis</i>	<i>Aulacaspis</i>
* <i>marchali</i>	<i>Hemichionaspis</i>	Cockerell	1902 : 82	Dahomey, French Guinea	<i>Hemichionaspis</i>	<i>Hemichionaspis</i>
* <i>margurites</i>	<i>Chionaspis</i>	Brain	1919 : 231	S. Africa	<i>Dyplachionaspis</i>	<i>Dentachionaspis</i>
* <i>marguritis</i>	<i>Lepidosaphes</i>	Leonardi	1914 : 211	French Guinea	—	Indeterminate, not <i>Leppi-</i> <i>doserphes</i>
* <i>masironae</i>	<i>Chionaspis</i> ( <i>Dinaspis</i> )	Hall	1928 : 287	N. and S. Rhodesia	—	Type of <i>Ledaspis</i> gen. n.
* <i>muzeensis</i>	<i>Lepidosaphes</i>	Hall	1931 : 288	S. Rhodesia	—	<i>Aemidomytilus</i>

meridionalis	Leptidosaphes	Lindinger	1909	38	Cameroons	Triaspids	Indeterminate, not Triaspids
<i>minor strachani</i>	<i>Chionaspis</i>	Maskell	1884	33	Several records	<i>Hemichionaspis</i>	Indeterminate
<i>minor moosi</i>	<i>Hemichionaspis</i>	Cooley	1890	54	W. Africa	<i>Hemichionaspis</i>	Presumably a <i>Pinnaspis</i>
<i>*muntroi</i>	<i>Leptidosaphes</i>	Doane & Ferris	1919	401			= <i>Andaspis hauwaniensis</i>
<i>*nigtilaspidiformis</i>	<i>Rolaspis</i>	sp. n.	: 533		S. Africa		<i>Rolaspis</i>
<i>*natalensis</i>	<i>Chionaspis</i>	Newstead	1912	19	S. W. Africa	<i>Duplacionaspis</i>	Probably a <i>Duplacionaspis</i>
<i>*nataleis</i>	<i>Chionaspis</i>	Maskell	1896	390	S. Africa	<i>Phenacaspis</i>	= <i>Phenacaspis dilatata</i>
<i>*naudei</i>	<i>Phenacaspis</i>	Cockerell	1902	25			<i>Contigaspis</i>
<i>*newsteadi</i>	<i>Contigaspis</i>	sp. n.	: 509		S. Africa		Type of <i>Pudaspis</i> gen. n.
<i>*nigerensis</i>	<i>Diaspis</i>	Leonardi	1914	190	S. Africa	<i>Duplacionaspis</i>	<i>Voraspis</i>
<i>*nudata</i>	<i>Chionaspis</i>	Vayssière	1912	368	Nigeria, Senegal	<i>Duplacionaspis</i>	Type of <i>Augulaspis</i>
<i>*oleae</i>	<i>Chionaspis</i>	Newstead	1911a	: 170	Tanganyika	<i>Augulaspis</i>	<i>Parlatoria</i>
<i>*olivina</i>	<i>Diaspis</i>	Colvée	1880	39	Sudan	<i>Syngenaspis</i>	Indeterminate, not <i>Leptidosaphes</i>
<i>*pandani</i>	<i>Leptidosaphes</i>	Leonardi	1913	: 68	Eritrea		= <i>Pinnaspis buzi</i>
<i>*paolii</i>	<i>Mytilaspis</i>	Comstock	1881	: 324	Italian Somaliland		<i>Duplacionaspis</i> possibly <i>D. asparagi</i> Laing & Cockerell
<i>*partnarii</i>	<i>Chionaspis</i>	Malenotti	1916	: 351			<i>Africaspis</i>
<i>*parlatorioides</i>		Hall	1943	: 3	S. Rhodesia	<i>Pseudoparlatoria</i>	Apparently a <i>Diaspis</i>
<i>*parva</i>	<i>Poliaspis</i>	Comstock	1883	: 64	Tanganyika	<i>Diaspis</i>	<i>Africaspis</i>
<i>*pattersoni</i>	? <i>Aspidiotus</i>	Lindinger	1910	: 44	Tanganyika		= <i>Fiorinia fortinae</i> Targioni
<i>*pellucida</i>	<i>Diaspis</i>	Green & Laing	1923	: 124	Gold Coast		<i>Pseudaulacaspis</i>
<i>*pentagona</i>	<i>Fiorinia</i>	Targioni	1869	: 42			<i>Parlatoria</i>
	<i>Diaspis</i>	Targioni	1885	: No. 11	San Thomé, S. Rhodesia, S. Africa, Tanganyika, Zanzibar		<i>Gymnaspidis</i>
<i>*pergandii</i>		Comstock	1881	: 327	Sierra Leone, S. Africa, Zanzibar		<i>Gymnaspidis</i>
<i>*perquandii camelliae</i>	<i>Parlatoria</i>		1883	: 114	S. Africa		<i>Dentacionaspis</i>
<i>*perpusilla</i>	<i>Parlatoria</i>	Comstock	1897	: 290			Type of <i>Cooleaspis</i>
<i>*pinnaeformis</i>	<i>Parlatoria</i>	Maskell	1851	: 111			<i>Parlatoria</i>
<i>*pitiospori</i>	<i>Aspidiotus</i>	Bouché	1929	: 373	S. Rhodesia		= <i>Parlatoria camelliae</i>
<i>*praelonga</i>	<i>Chionaspis</i> ( <i>Dinaspis</i> )	Hall	1920	: 203	Uganda		= <i>Leptidosaphes beckii</i>
<i>*proteae</i>	<i>Chionaspis</i> ( <i>Dinaspis</i> )	Newstead	1928	: 289			<i>Dentacionaspis</i>
<i>*proxima</i>	<i>Aspidiotus</i>	Curtis	1843	: 676			Type of <i>Cooleaspis</i>
	<i>Hemichionaspis</i>	Leonardi	1914	: 193	S. Africa, Tanganyika		= <i>Ledaspis distincta</i>
<i>*pseudaspidiotus</i>		Lindinger	1905	: 131	Dahomey, French Guinea, Nigeria, Portuguese W. Africa, Senegal, S. Africa		<i>Parlatoria</i>
<i>*pseudomorpha</i>	<i>Dinaspis</i>	Leonardi	1914	: 218	Sudan		<i>Pinnaspis</i>
<i>*pseudonitaea</i>	<i>Chionaspis</i>	Malenotti	1916	: 349	French Guinea		<i>Genaparlatoria</i>
<i>*pugionifera</i>	<i>Diaspis</i>	Lindinger	1909	: 24	Italian Somaliland		Indeterminate, not <i>Dinaspis</i>
<i>*punicae</i>	<i>Leptidosaphes</i>	Laing	1929	: 500	Cameroons		<i>Dentacionaspis</i>
<i>*pyroaema</i>	<i>Chionaspis</i> ( <i>Dinaspis</i> )	Hall	1937	: 120	Tanganyika		Type of <i>Incispaspis</i>
<i>*regularis</i>	<i>Fiorinia</i> ( <i>Adiscoforina</i> )	Green & Laing	1923	: 124	S. Rhodesia		<i>Andaspis</i>
<i>*reticulata</i>	<i>Diaspis</i>	Newstead	1911	: 86	Tanganyika		<i>Inchoaspis</i>
<i>*reticulata minor</i>	<i>Diaspis</i>	Malenotti	1916	: 343	Uganda		<i>Adiscoforina</i>
	<i>Dinaspis</i>	Malenotti	1916	: 346	Italian Somaliland, S. Rhodesia		<i>Diaspis</i>
	<i>Chionaspis</i> ( <i>Dinaspis</i> )	Hall	1928	: 290	Italian Somaliland		<i>Ledaspis</i>
<i>*retigera</i>		Cockerell	1901	: 249	S. Africa, Tanganyika		= <i>Ledaspis reticulata</i> Malenotti
<i>*rhuseae</i>	<i>Chionaspis</i>	Hall	1928	: 280			<i>Tecaspis</i>
	<i>Hovardia</i>	Brain	1919	: 225			= <i>Furchadaspis zamiae</i>
	<i>Diaspis</i>						<i>Duplacionaspis</i>

LIST OF SPECIES RECORDED FROM THE ETHIOPIAN REGION—continued.

Species name	Generic name	Author	Reference	Distribution records	Generic assignment by MacGillivray	Generic assignment adopted here
* <i>richiei</i>	<i>Chionaspis</i>	Leaing	1929 : 483	Sierra Leone, Tanganyika	<i>Aulacaspis</i>	<i>Dentachionaspis</i>
* <i>roseae</i>	<i>Aspidichas</i>	Bouché	1894 : 14	Tanganyika	—	<i>Aulacaspis</i>
* <i>rugosa</i>	<i>Dentaspis</i>	Hall	1946 : 62	Uganda	—	<i>Dentaspis</i>
* <i>sacchari</i>	<i>Lepidosaphes</i>	Hall	1923 : 23	Sierra Leone	—	<i>Lepidosaphes</i>
* <i>senegalensis</i>	<i>Chionaspis</i>	Brain	1920 : 95	S. Africa	<i>Contigaspis</i>	<i>Africanaspis</i>
* <i>shivestrii</i>	<i>Diaspis</i>	Vayssiére	1914 : 206	Senegal	<i>Diaspis</i>	Apparently a <i>Diaspis</i>
* <i>shivestrii</i>	<i>Diaspis</i>	Leonardi	1914 : 220	French Guinea	—	Indeterminate
* <i>shivestrii</i>	<i>Howardi</i>	Leonardi	1914 : 187	French Guinea	—	Indeterminate, not
* <i>shivestrii</i>	<i>Ichonaspis</i>	Leonardi	1914 : 222	French Guinea	—	<i>Howardi</i>
* <i>sinicae</i>	<i>Chionaspis</i>	Hall	1928 : 281	S. Rhodesia	—	Indeterminate
* <i>somalensis</i>	<i>Coccomytilus</i>	Matenotti	1916 : 353	Italian Somaliland	—	Indeterminate, not <i>Cocco-</i>
* <i>spatulata</i>	<i>Diaspis</i>	Hall	1929 : 363	S. Rhodesia	—	<i>mytilus</i>
* <i>spartinae natalensis</i>	<i>Chionaspis</i>	Maskell	1896 : 390	S. Rhodesia	—	<i>Diaspis</i>
* <i>spiculata</i>	New name for <i>Chionaspis chaetachmae</i> var. <i>imbri-</i> <i>cata</i>	Hall	: 532	S. Africa, S. Rhodesia	—	= ? <i>Duplacionaspis natal-</i> <i>ensis</i>
* <i>stanophori</i>	<i>Chionaspis</i>	Cooley	1899 : 35	S. Africa, S. Rhodesia	<i>Chionaspis</i>	<i>Duplacionaspis</i>
* <i>sterculiae</i>	<i>Chionaspis</i>	Leaing	1932 : 62	Belgian Congo	—	<i>Chionaspis</i>
* <i>stilosa</i>	<i>Diaspis</i>	Lindinger	1909 : 25	Cameroons	<i>Diaspis</i>	Apparently a <i>Diaspis</i>
* <i>subnodata</i>	<i>Chionaspis</i>	Newstead	1912 : 19	S. and S.W. Africa	<i>Contigaspis</i>	Type of <i>Contigaspis</i>
* <i>subregularis</i>	<i>Diaspis</i>	Hall	1929 : 362	S. Rhodesia	—	<i>Diaspis</i>
* <i>subregularis spatula-</i> <i>lata</i>	<i>Diaspis</i>	Hall	1929 : 363	S. Rhodesia	—	= <i>Diaspis spatulata</i>
* <i>subvisci</i>	<i>Chionaspis</i>	Newstead	1910 : 197	Tanganyika, Uganda	—	Type of <i>Dentaspis</i>
* <i>tangana</i>	<i>Chionaspis</i> ( <i>Phenacaspis</i> )	Hall	1929 : 369	S. Rhodesia	—	<i>Tecaspis</i>
* <i>tegalensis</i>	<i>Phenacaspis</i>	Lindinger	1910 : 45	Tanganyika	<i>Phenacaspis</i>	Possible a <i>Voraspi</i>
* <i>tevisidiculus</i>	<i>Chionaspis</i>	Zehntner	1898 : 7	Tanganyika	—	<i>Aulacaspis</i>
* <i>tensior</i>	<i>Chionaspis</i>	Newstead	1920 : 202	Uganda	<i>Asymmetraspis</i>	Type of <i>Salaspis</i> gen. n.
* <i>tricuspidata</i>	<i>Lepidosaphes</i>	Lindinger	1909 : 40	Cameroons	<i>Lepidosaphes</i>	Indeterminate
* <i>tuberculata</i>	<i>Diaspis</i>	Leonardi	1914 : 192	Nigeria	—	<i>Pseudoperlataria</i> possibly <i>P.</i> <i>parlatarioides</i> Comstock
* <i>tuberculatis</i>	<i>Chionaspis</i> ( <i>Pinnaspis</i> )	Hall	1929 : 368	S. Rhodesia	—	<i>Gadaspis</i>
* <i>tursioides</i>	<i>Aulacaspis</i>	Newstead	1906 : 73	S. Rhodesia	<i>Aulacaspis</i>	= <i>Aulacaspis cinnamomi</i> Newstead
* <i>uapacae</i>	<i>Chionaspis</i>	Leaing	1929 : 480	—	—	= <i>Tecaspis retigera</i> Cocke- rell
* <i>ugandae</i>	<i>Chionaspis</i> ( <i>Diaspis</i> )	Hall	1928 : 291	—	—	= <i>Ledaspis dura</i> Newstead
* <i>umtali</i>	<i>Duplacionaspis</i>	Hall	1946 : 64	Uganda	—	<i>Duplacionaspis</i>
* <i>umita</i>	<i>Chionaspis</i> ( <i>Phenacaspis</i> )	Hall	1929 : 370	S. Rhodesia	—	Type of <i>Tecaspis</i> gen. n.
<i>usambarica</i>	<i>Chionaspis</i>	Lindinger	1910 : 43	—	—	= <i>Africanaspis chionaspis</i> for- mis
* <i>visci</i>	<i>Chionaspis</i>	Lindinger	1913 : 76	Italian Somaliland, Tangan- yika	—	Possibly a <i>Voraspi</i>
* <i>visci umtali</i>	<i>Coccus</i>	Schrank	1781 : 296, 588	S. Africa	—	<i>Carulaspis</i>
* <i>visci umtali</i>	<i>Chionaspis</i> ( <i>Phenacaspis</i> )	Brain	1919 : 235	S. Africa, S. Rhodesia	<i>Phenacaspis</i>	<i>Tecaspis</i>
* <i>visci umtali</i>	<i>Chionaspis</i> ( <i>Phenacaspis</i> )	Hall	1929 : 370	—	—	= <i>Tecaspis umtali</i>
* <i>whitehilli</i>	<i>Chionaspis</i>	Marchal	1909 : 69	French Guinea	<i>Marchalaspis</i>	Type of <i>Marchalaspis</i>
* <i>zamia</i>	<i>Phenacaspis</i>	Hall	1946 : 68	S. Africa	—	Type of <i>Rolaspis</i>
* <i>zizyphi</i>	<i>Diaspis</i>	Morgan	1890 : 44	S. Africa, S. Rhodesia	<i>Furchadaspis</i>	Type of <i>Furchadaspis</i>
	<i>Coccus</i>	Lucas	1853 : xxviii	Belgian Congo, French Guinea, Gambia, S. Africa	<i>Parlatoria</i>	Type of <i>Parlatoria</i>

\* Either the "type" or what is believed to be typical or authentic material examined.



LIST OF SPECIES ARRANGED ACCORDING TO HOST PLANT GENERA.

It is hoped that most of the more important records have been included in the following list, but there may be a few that have been overlooked. Some have been purposely omitted where there appear to be good reasons to doubt the determinations. As the records have been derived from a variety of sources, the author cannot hold himself responsible for inaccuracies, whether they be of plant or insect, but it is believed that the list gives a reasonably accurate picture of the position so far as our present knowledge will permit.

The generic names follow those adopted in this paper, but where the species has not been actually seen the original author's generic name has been quoted, except in a few cases where there could be no doubt of its correct generic position.

ACANTHACEAE.

- Asystasia*.  
*Pseudaulacaspis pentagona* (Targioni).

ACERACEAE.

- Acer*.  
*Diaspis boisduvalii* Signoret.  
*Diaspis bromeliae* (Kerner),

AMARANTACEAE.

- Alternanthera*.  
*Contigaspis cyanogena* (Brain).

ANACARDIACEAE.

- Lannea*.  
*Africaspis chionaspiformis* (Newstead).  
*Mangifera*.

- Aulacaspis cinnamomi* Newstead.  
*Genaparlatoria pseudaspidotus* (Lindinger).  
*Phenacaspis dilatata* (Green).  
*Pinnaspis proxima* (Leonardi).  
*Pseudaulacaspis pentagona* (Targioni).

*Rhus*.

- Bantudiaspis loranthi* (Hall).  
*Furchadaspis zamiae* (Morgan).  
*Gymnaspis faurei* Brain.  
*Lepidosaphes florii* Leonardi.  
*Rolaspis lounsburyi* (Cooley).  
*Tecaspis mytilaspiformis* (Newstead).  
*Schinus*.  
*Pseudaulacaspis pentagona* (Targioni).

ANNONACEAE.

- Annona*.  
*Pinnaspis proxima* (Leonardi).

APOCYNACEAE.

- Allamanda*.  
*Pseudaulacaspis pentagona* (Targioni).  
*Carissa*.

- Diaspis carissae* Hall.  
*Diaspis subregularis* Hall.  
*Rolaspis carissae* (Cockerell).  
*Rolaspis spiculata* (new name).

*Funtumia*.

- Chionaspis lutea* Newstead.  
*Mitulaspis funtumiae* (Newstead).

*Plumeria*.

- Diaspis boisduvalii* Signoret.  
*Howardia biclavis* (Comstock).  
*Pseudaulacaspis pentagona* (Targioni).

*Rauwolfia*.

- Africaspis pattersoni* (Green & Laing).

ARACEAE.

- Anthurium*.  
*Parlatoria pergandii* (Comstock).  
*Anubias*.  
*Pinnaspis buxi* (Bouché).

ARALIACEAE.

- Cussonia*.  
*Furchadaspis zamiae* (Morgan).

ARISTOLOCHACEAE.

- Aristolochia*.  
*Pseudoparlatoria parlatorioides* (Comstock).

ASCLEPIADACEAE.

- Calotropis*.  
*Pinnaspis proxima* (Leonardi).

BERBERIDACEAE.

- Berberis*.  
*Pseudaulacaspis pentagona* (Targioni).

BIGNONIACEAE.

- Bignonia*.  
*Howardia biclavis* (Comstock).  
*Pseudaulacaspis pentagona* (Targioni).

*Catalpa*.

- Pseudaulacaspis pentagona* (Targioni).  
*Tecoma*.

- Pseudaulacaspis pentagona* (Targioni).

BORAGINACEAE.

- Heliotropium*.  
*Pseudaulacaspis pentagona* (Targioni).

BROMELIACEAE.

- Ananas*.  
*Diaspis bromeliae* (Kerner).  
*Bilbergia*.

- Diaspis bromeliae* (Kerner).

BUXACEAE.

- Buxus*.  
*Ischnaspis longirostris* (Signoret).  
*Rolaspis carissae* (Cockerell).

CACTACEAE.

- Opuntia*.  
*Diaspis echinocacti* (Bouché).

CAPPARIDACEAE.

- Cadaba*.  
*Dentachionaspis berleseii* (Malenotti).  
*Capparis*.  
*Africaspis chionaspiformis* (Newstead).  
*?Dentachionaspis capparisii* (Brain).  
*Ledaspis reticulata* (Malenotti).  
*Tecaspis retigera* (Cockerell).

## CAPRIFOLIACEAE.

*Lonicera.**Howardia biclavata* (Comstock).

## CARICACEAE.

*Carica.**Howardia biclavata* (Comstock).*Pseudaulacaspis pentagona* (Targioni).

## CELASTRACEAE.

*Cassine.**Greenaspis elongata* (Green).*Elaeodendron.**Tecaspis subvisci* (Hall).*Gymnosporia.**Dentachionaspis lounsburyi* (Leonardi).

## COMBRETACEAE.

*Combretum.**Gadaspis combreti* (Hall).*Gadaspis excisa* (Hall).*Terminalia.**Africaspis fici* (Newstead).

## COMPOSITAE.

*Senecio.**Rolaspis compositae* sp. n.

## CONIFERAE.

*Juniperus.**Carulaspis visci* (Schränk).*Thuja.**Carulaspis visci* (Schränk).

## CONNARACEAE.

*Connarus.**Diaspis africana* Lindinger.

## CORNACEAE.

*Aucuba.**Ischnaspis longirostris* (Signoret).

## CUCURBITACEAE.

*Sphaerosicyos.**Phenacaspis dilatata* (Green).

## CYCADACEAE.

*Cycas.**Furchadaspis zamiae* (Morgan).*Encephalartos.**Parlatoria proteus* (Curtis).

## CYPERACEAE.

*Cyperus.**Duplacionaspis paolii* (Malenotti).

## DIPTEROCARPACEAE.

*Monotes.**Africaspis chionaspiformis* (Newstead).

## EBENACEAE.

*Diospyros.**Africaspis diospyros* (Hall).*Euclea.**Dinaspis imbricata* Brain.*Royena.**Howardia biclavata* (Comstock).

## EUPHORBIACEAE.

*Aleurites.**Andaspis hawaiiensis* (Maskell).*Codiaeum.**Lepidosaphes gloverii* (Packard).*Croton.**Fiorinia fioriniae* (Targioni).*Lepidosaphes beckii* (Newman).*Lepidosaphes gloverii* (Packard).*Parlatoria pergandii* Comstock.

## EUPHORBIACEAE continued.

*Cyclostemon.**Ischnaspis bipindensis* Lindinger.*Euphorbia.**Balaspis faurei* gen. and sp. n.*Dentaspis globosus* (Brain).*Morasaspis euphorbiae* (Brain).*Rolaspis whitehilli* (Hall).*Fluggea.**Parlatoria fluggeae* Hall.*Hevea.**Pseudaulacaspis pentagona* (Targioni).*Manihot.**Aonidomytilus albus* (Cockerell).*Gymnaspis africana* Newstead.*Poinsettia.**Howardia biclavata* (Comstock).*Pseudaulacaspis pentagona* (Targioni).*Ricinus.**Aulacaspis fulleri* (Cockerell).*Pseudaulacaspis pentagona* (Targioni).*Sapium.**Diaspis spatulata* (Hall).*Uapaca.**Africaspis chipingae* Hall.*Dentachionaspis pittospori* (Hall).*Gadaspis tuberculata* (Hall).*Ledaspis dura* (Newstead).*Ledaspis kirkianae* (Hall).*Ledaspis mashonae* (Hall).

Genera unspecified.

*Cryptodiaspis conservans* Lindinger.

## FAGACEAE.

*Castanea.**Andaspis hawaiiensis* (Maskell).

## FLACOURTIACEAE.

*Kiggelaria.**Tecaspis kiggelariae* (Brain).

## GERANIACEAE.

*Geranium.**Pseudaulacaspis pentagona* (Targioni).

## GRAMINEAE.

*Andropogon.**Duplacionaspis stanotophri* (Cooley).*Bambusa.**Kuwanaspis bambusicola* (Cockerell).*Chasmopodium.**Lepidosaphes sacchari* Hall.*Cymbopogon.**Duplacionaspis stanotophri* (Cooley).*Cynodon.**Duplacionaspis asparagi* (Laing & Cockerell).*Eulalia.**Duplacionaspis stanotophri* (Cooley).*Panicum.**Duplacionaspis asparagi* (Laing & Cockerell).*Saccharum.**Aulacaspis madiunensis* (Zehntner).*Aulacaspis tegalensis* (Zehntner).*Stenotaphrum.**Duplacionaspis stanotophri* (Cooley).

Genera unspecified.

*Aulacaspis herbae* (Green).

## GRAMINEAE continued.

Genera unspecified continued.

- Chionaspis natalensis* Maskell.  
*Duplacionaspis stanotophri* (Cooley).  
*Duplacionaspis ugandae* Hall.  
*Rolaspis lounsburyi* (Cooley).

## JUGLANDACEAE.

- Juglans*.  
*Pseudaulacaspis pentagona* (Targioni).

## LABIATAE.

- Coleus*.  
*Lepidosaphes beckii* (Newman).

## LAURACEAE.

- Litsea*.  
*Aulacaspis cinnamomi* Newstead.

## LEGUMINOSAE.

- Acacia*.  
*Africaspis caffra* (Brain).  
*Andaspis hawaiiensis* (Maskell).  
*Aonidomytilus mazoensis* (Hall).  
*Coccomytilus somalensis* Malenotti.  
*Dentacionaspis lounsburyi* (Leonardi).  
*Pinnaspis aspidistrae* (Signoret).  
*Pudaspsis newsteadi* (Leonardi).  
*Baobab*.  
*Diaspis bicolor* Laing.  
*Diaspis boisduvalii* Signoret.  
*Diaspis helveola* Laing.  
*Baphia*.  
*Africaspis baphiae* Hall.  
*Baptisia*.  
*Andaspis hawaiiensis* (Maskell).  
*Bauhinia*.  
*Howardia biclavis* (Comstock).  
*Voraspsis bauhiniae* (Hall).  
*Berlinia*.  
*Africaspis berliniae* (Hall).  
*Aonidomytilus brachystegiae* (Hall).  
*Coccomytilus chitinosus* Lindinger.  
*Brachystegia*.  
*Africaspis berliniae* (Hall).  
*Aonidomytilus brachystegiae* (Hall).  
*Cassia*.  
*Africaspis chionaspiformis* (Newstead).  
*Andaspis hawaiiensis* (Maskell).  
*Contigaspis naudei* sp. n.  
*Copaifera*.  
*Marchalaspis vuilleti* (Marchal).  
*Crudia*.  
*Lepidosaphes crudiae* Lindinger.  
*Cynometra*.  
*Cryptodiaspis limuloides* Lindinger.  
*Lepidosaphes aberrans* Lindinger.  
*Lepidosaphes tenuior* Lindinger.  
*Erythrina*.  
*Andaspis hawaiiensis* (Maskell).  
*Pseudaulacaspis pentagona* (Targioni).  
*Gleditchia*.  
*Pseudaulacaspis pentagona* (Targioni).  
*Indigofera*.  
*Contigaspis indigoferae* (Hall).  
*Kennedy*.  
*Pseudaulacaspis pentagona* (Targioni).  
*Leucaena*.  
*Howardia biclavis* (Comstock).

## LEGUMINOSAE continued.

- Macrolobium*.  
*Cryptodiaspis hamata* Lindinger.  
*Daraspis bussii* (Newstead).  
*Ischnaspis macrolobii* Laing.  
*Lepidosaphes meridionalis* Lindinger.

## LILIACEAE.

- Aloe*.  
*Dentacionaspis margaritae* (Brain).  
*Nelaspis exalbida* (Cockerell).  
*Nelaspis humilis* (Brain).  
*Asparagus*.  
*Duplacionaspis asparagi* (Laing & Cockerell).

- Aspidistra*.  
*Pinnaspis aspidistrae* (Signoret).

- Cordyline*.  
*Ischnaspis longirostris* (Signoret).

- Dracaena*.  
*Ischnaspis longirostris* (Signoret).  
*Phenacaspis tangana* Lindinger.

## LOGANIACEAE.

- Strychnos*.  
*Diaspis stilosa* Lindinger.  
*Ischnaspis bipindensis* Lindinger.  
*Ischnaspis longirostris* (Signoret).

## LORANTHACEAE.

- Loranthus*.  
*Bantudiaspis loranthi* (Hall).  
*Diaspis parva* Lindinger.  
*Diaspis subregularis* Hall.  
*Lepidosaphes beckii* (Newman).  
*Lepidosaphes kamerunensis* Lindinger.  
*Scleromytilus hargreavesi* Hall.  
*Sclopetaspis laniger* (Newstead).

- Viscum*.  
*Carulaspis visci* (Schränk).  
*Inchoaspis dentilobis* (Newstead).  
*Tecaspis visci* (Brain).

## LYTHRACEAE.

- Lagerstroemia*.  
*Andaspis hawaiiensis* (Maskell).

## MALVACEAE.

- Gossypium*.  
*Ischnaspis longirostris* (Signoret).  
*Pinnaspis gossypii* (Newstead).  
*Hibiscus*.  
*Africaspis chionaspiformis* (Newstead).  
*Pseudaulacaspis pentagona* (Targioni).  
*Sida*.  
*Pseudaulacaspis pentagona* (Targioni).

## MARANTACEAE.

- Maranta*.  
*Diaspis boisduvalii* Signoret.

## MELIACEAE.

- Cedrela*.  
*Pseudaulacaspis pentagona* (Targioni).  
*Ekebergia*.  
*Rolaspis lounsburyi* var. *ekebergiae* (Brain).  
*Khaya*.  
*Africaspis chionaspiformis* (Newstead).  
*Diaspis senegalensis* Vayssière.  
*Melia*.  
*Africaspis chionaspiformis* (Newstead).

## MELIACEAE continued.

*Melia* continued.*Aulacaspis fulleri* (Cockerell).*Trichilia*.*Howardia biclavata* (Comstock).*Ischnaspis longirostris* (Signoret).*Pinnaspis buxi* (Bouché).*Rolaspis lounsburyi* var. *ekebergiae* (Brain).*Turraea*.*Africaspis chionaspiformis* (Newstead).*Bantudiaspis loranthi* (Hall).*Xylocarpus*.*Chionaspis usambarica* Lindinger.

## MORACEAE.

*Ficus*.*Africaspis chionaspiformis* (Newstead).*Africaspis communis* (Hall).*Africaspis fici* (Newstead).*Epidiaspis ficifoliae* Hall.*Morus*.*Pseudaulacaspis pentagona* (Targioni).

## MUSACEAE.

*Musa*.*Phenacaspis dilatata* (Green).*Strelitzia*.*Pseudaulacaspis pentagona* (Targioni).

## MYRTACEAE.

*Callistemon*.*Parlatoria pergandii* Comstock.*Eugenia*.*Andaspis hawaiiensis* (Maskell).*Psidium*.*Pseudaulacaspis pentagona* (Targioni).*Syzygium*.*Diaspis africana* Lindinger.

## OLACACEAE.

*Ximenia*.*Voraspis nigerensis* (Vayssière).

## OLEACEAE.

*Jasminum*.*Andaspis hawaiiensis* (Maskell).*Parlatoria oleae* (Colvée).*Ligustrum*.*Howardia biclavata* (Comstock).*Olea*.*Lepidosaphes olivina* Leonardi.*Syringa*.*Chionaspis ambiguus* Brain.

## ONAGRACEAE.

*Fuchsia*.*Pseudaulacaspis pentagona* (Targioni).

## ORCHIDACEAE.

Genera unspecified.

*Diaspis boisduvalii* Signoret.*Parlatoria pergandii* Comstock.*Parlatoria proteus* (Curtis).

## PALMAE.

*Borassus*.*Fiorinia kewensis* Newstead.*Cocos*.*Pinnaspis buxi* (Bouché).*Elaeis*.*Pinnaspis marchali* (Cockerell).

## PALMAE continued.

*Hyphaene*.*Dentachionaspis pseudonivea* (Malenotti).*Phoenix*.*Dentaspis substriata* (Newstead).*Fiorinia fioriniae* (Targioni).*Ischnaspis longirostris* (Signoret).*Parlatoria blanchardii* (Targioni).*Phenacaspis inday* (Banks).*Rolaspis chaetachmae* (Brain).*Ptychosperma*.*Andaspis hawaiiensis* (Maskell).

Genera unspecified.

*Dentaspis substriata* (Newstead).*Diaspis boisduvalii* Signoret.*Fiorinia fioriniae* (Targioni).*Ischnaspis longirostris* (Signoret).*Leucaspis cockerelli* (de Charmoy).*Phenacaspis dilatata* (Green).

## PANDANACEAE.

*Pandanus*.*Pinnaspis buxi* (Bouché).

## PASSIFLORACEAE.

*Passiflora*.*Pseudaulacaspis pentagona* (Targioni).

## PITTOSPORACEAE.

*Pittosporum*.*Dentachionaspis pittospori* (Hall).

## POLYPODIACEAE.

*Adiantum*.*Pinnaspis aspidistrae* (Signoret).*Asplenium*.*Pinnaspis aspidistrae* (Signoret).*Pteris*.*Pinnaspis aspidistrae* (Signoret).

## PROTEACEAE.

*Faurea*.*Bantudiaspis faureae* Hall.*Ledaspis distincta* (Leonardi).*Leucadendron*.*Rolaspis leucadendri* (Brain).*Protea*.*Asymmetraspis distorta* (Newstead).*Ledaspis distincta* (Leonardi).

Genera unspecified.

*Rolaspis lounsburyi* (Cooley).

## PUNICACEAE.

*Punica*.*Andaspis punicae* (Laing).

## RHAMNACEAE.

*Scutia*.*Africaspis scutiae* (Brain).*Tecaspis retigera* (Cockerell).*Zizyphus*.*Africaspis communis* (Hall).*Finaspis distincta* (Hall).

## ROSACEAE.

*Parinarium*.*Africaspis parinari* (Hall).*Prunus*.*Pseudaulacaspis pentagona* (Targioni).*Pygaëum*.*Inchoaspis pygaei* (Hall).

## ROSACEAE continued.

- Pyrus*.  
*Pseudaulacaspis pentagona* (Targioni).  
*Raphiolepis*.  
*Howardia biclavis* (Comstock).  
*Rosa*.  
*Aulacaspis rosae* Bouché.

## RUBIACEAE.

- Bouvardia*.  
*Pseudaulacaspis pentagona* (Targioni).  
*Cinchona*.  
*Africaspis chionaspiformis* (Newstead).  
*Coffea*.  
*Dentachionaspis ritchiei* (Laing).  
*Diaspis boideuvalii* Signoret.  
*Ischnaspis longirostris* (Signoret).  
*Mitragyne*.  
*Incisaspis pugionifera* (Lindinger).

## RUTACEAE.

- Calodendron*.  
*Andaspis hawaiiensis* (Maskell).  
*Phenacaspis dilatata* (Green).  
*Citrus*.  
*Ischnaspis longirostris* (Signoret).  
*Lepidosaphes beckii* (Newman).  
*Lepidosaphes gloverii* (Packard).  
*Parlatoria camelliae* Comstock.  
*Parlatoria pergandii* (Comstock).  
*Parlatoria zizyphi* (Lucas).  
*Pinnaspis proxima* (Leonardi).  
*Unaspis citri* (Comstock).  
*Diosma*.  
*Versiculaspis diosmae* (Brain).  
*Murraya*.  
*Lepidosaphes beckii* (Newman).  
*Teclea*.  
*Dentaspis hargreavesi* (Laing).

## SALICACEAE.

- Populus*.  
*Pseudaulacaspis pentagona* (Targioni).  
*Salix*.  
*Lepidosaphes beckii* (Newman).  
*Pudaspis newsteadi* (Leonardi).  
*Rolaspis munroi* sp. n.  
*Tecaspis kiggelariae* (Brain).

## SALVADORACEAE.

- Dobera*.  
*Ledaspis reticulata* (Malenotti).

## SANTALACEAE.

- Osyris*.  
*Inchoaspis argentata* (Hall).

## SAPINDACEAE.

- Allophylus*.  
*Tecaspis allophylli* (Hall).  
*Tecaspis umtalii* (Hall).

## SAPOTACEAE.

- Chrysophyllum*.  
*Howardia biclavis* (Comstock).  
*Mimusops*.  
*Andaspis hawaiiensis* (Maskell).  
*Sideroxylon*.  
*Chionaspis usambarica* Lindinger.

## SCROPHULARIACEAE.

- Veronica*.  
*Pseudaulacaspis pentagona* (Targioni).

## SOLANACEAE.

- Lycium*.  
*Ambigaspis lycii* (Brain).  
*Solanum*.  
*Andaspis hawaiiensis* (Maskell).  
*Pseudaulacaspis pentagona* (Targioni).

## STERCULIACEAE.

- Dombeya*.  
*Hulaspis dombeyae* (Hall).  
*Sterculia*.  
*Chionaspis sterculiae* Laing.  
*Pseudaulacaspis pentagona* (Targioni).

## THEACEAE.

- Camellia*.  
*Fiorinia fioriniae* (Targioni).

## ULMACEAE.

- Celtis*.  
*Fiorinia fioriniae* (Targioni).  
*Chaetachme*.  
*Ischnaspis longirostris* (Signoret).  
*Rolaspis carissae* (Cockerell).  
*Rolaspis chaetachmae* (Brain).  
*Tecaspis retigera* (Cockerell).

## VERBENACEAE.

- Duranta*.  
*Howardia biclavis* (Comstock).

## VITACEAE.

- Vitis*.  
*Pseudaulacaspis pentagona* (Targioni).

## ZYGOPHYLLACEAE.

- Balanites*.  
*Ledaspis reticulata* (Malenotti).  
*Ledaspis reticulata* var. *minor* (Malenotti).  
*Tecaspis visci* (Brain).

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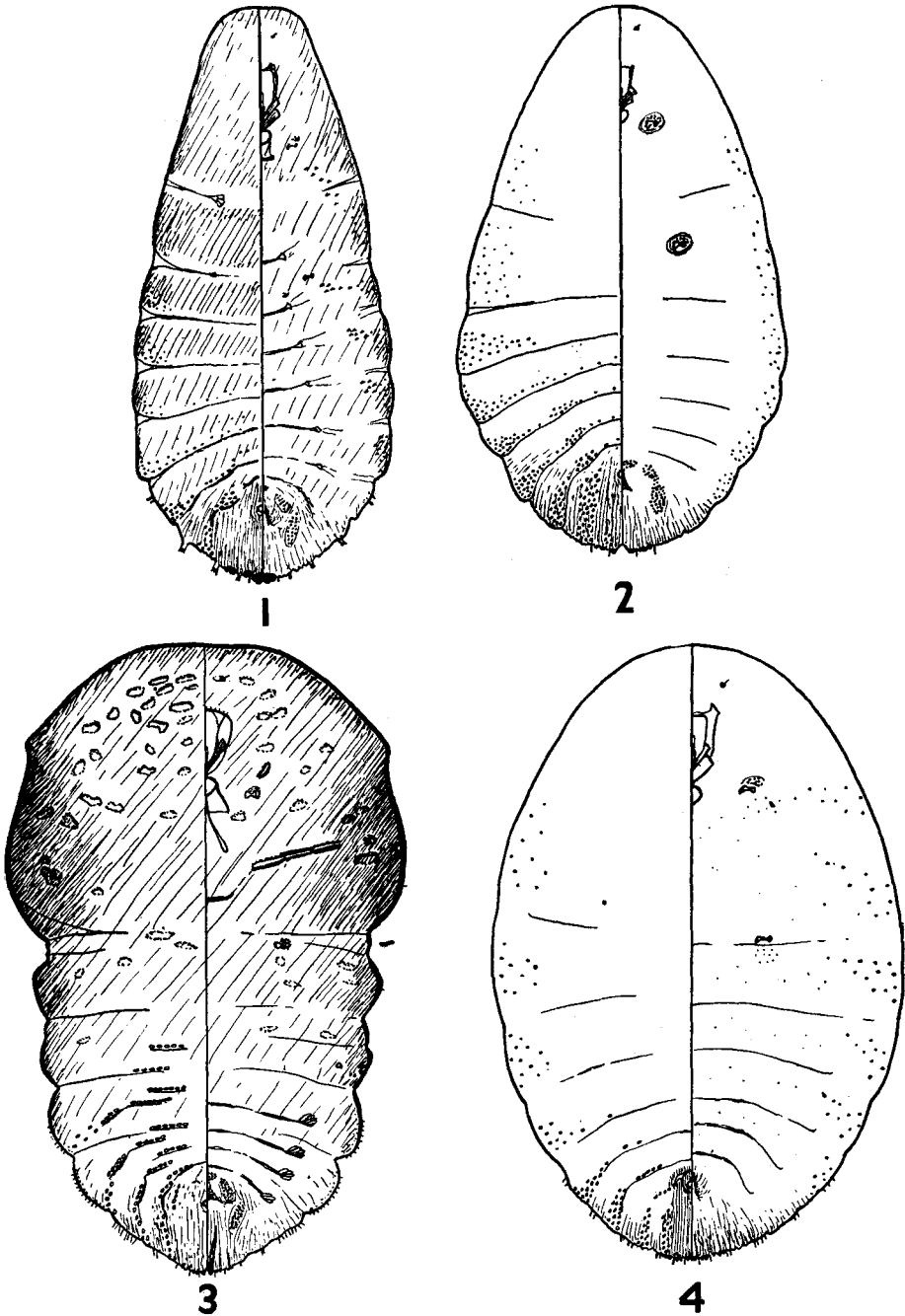


FIG. 1.—*Africaspis caffra* (Brain).

FIG. 2.—*Augulaspis nudata* (Newstead)—genotype.

FIG. 3.—*Aulacaspis fulleri* (Cockerell).

FIG. 4.—*Balaspis faurei* gen. and sp. n.—genotype.

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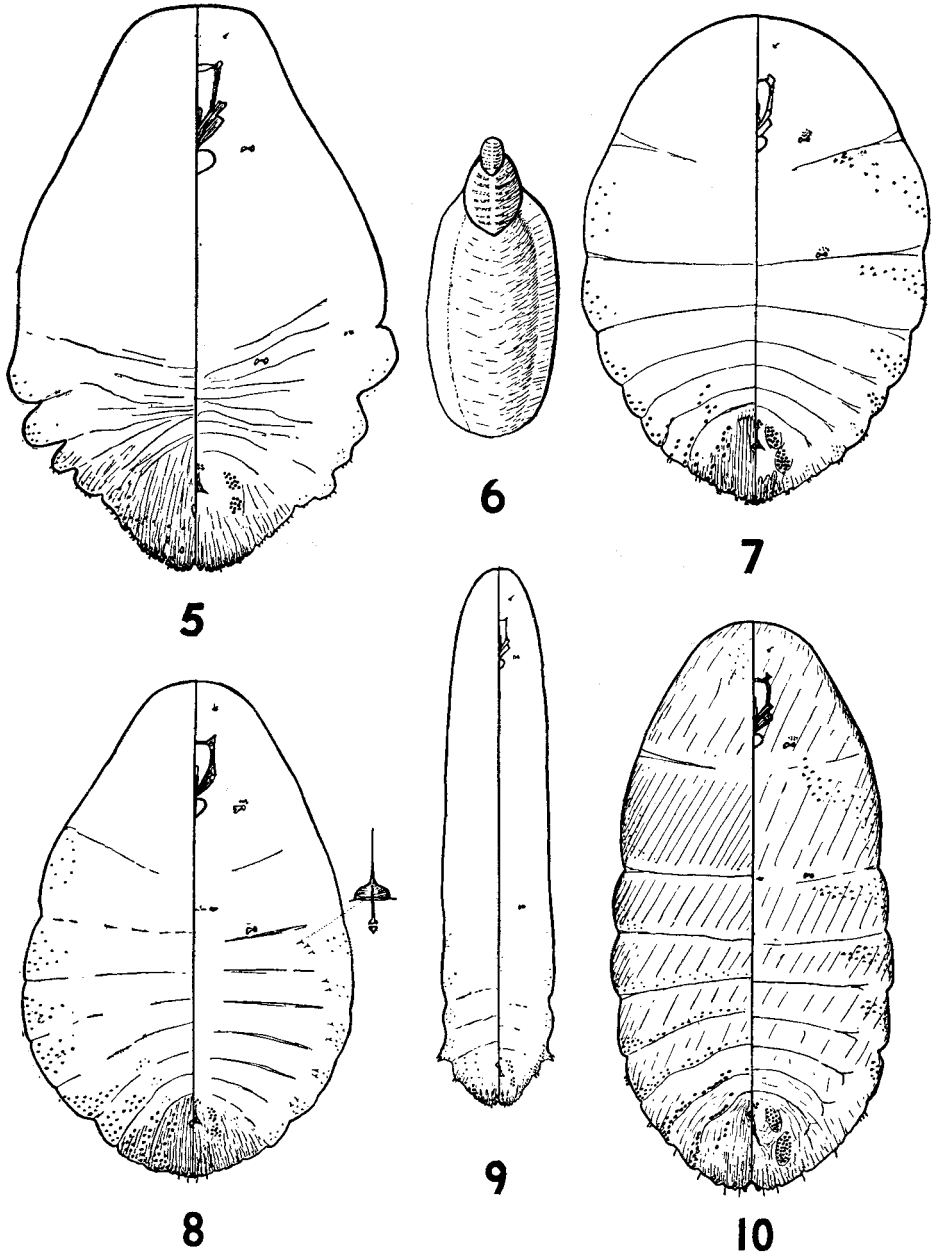


FIG. 5.—“*Chionaspis*” *lutea* Newstead.  
 FIG. 6.—“*Chionaspis*” *lutea* Newstead—scale of adult ♀.  
 FIG. 7.—*Contigaspis naudei* sp. n.  
 FIG. 8.—*Contigaspis subnudata* (Newstead)—genotype.  
 FIG. 9.—*Daraspis bussii* (Newstead)—genotype.  
 FIG. 10.—*Dentachionaspis margaritae* (Brain).

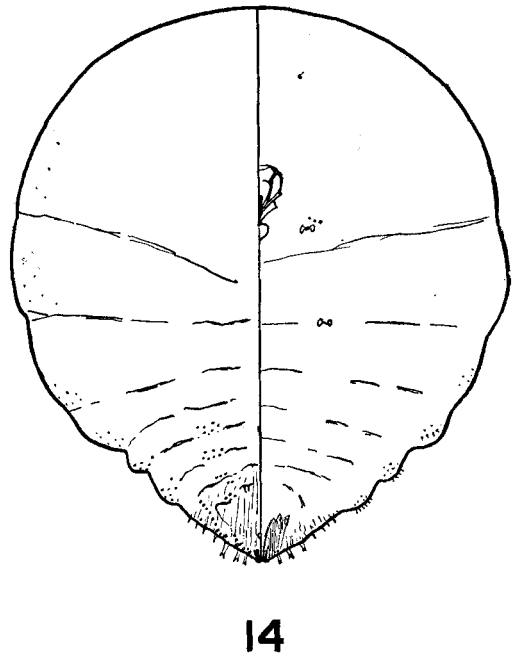
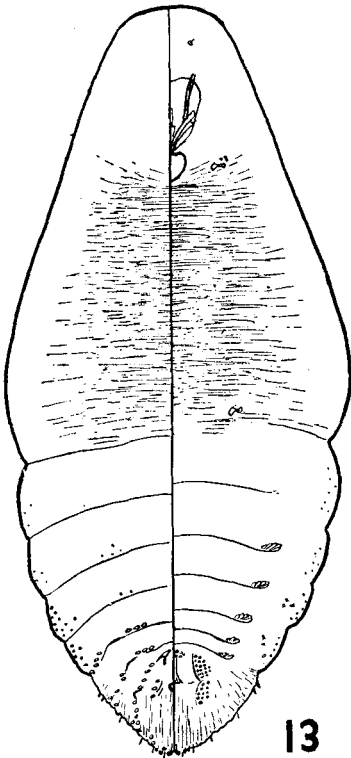
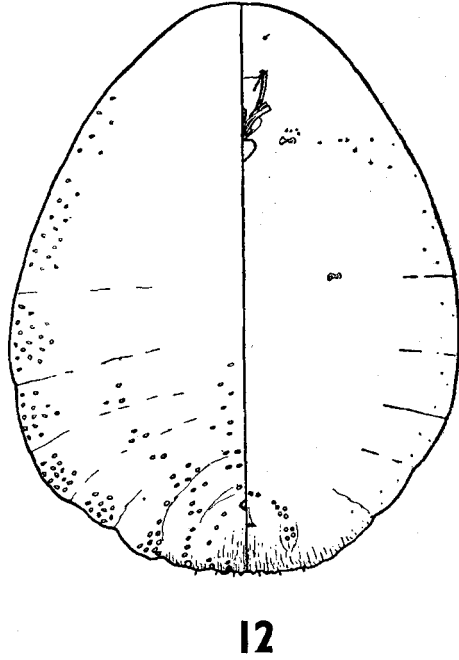
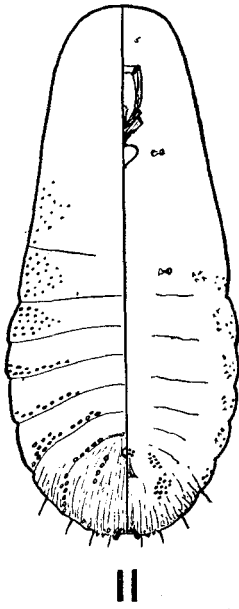


FIG. 11.—*Dentachionaspis pseudonivea* (Malenotti).  
FIG. 12.—*Dentaspis globosus* (Brain).  
FIG. 13.—*Duplachionaspis stanotophri* (Cooley).  
FIG. 14.—*Hulaspis dombeyae* (Hall)—genotype.

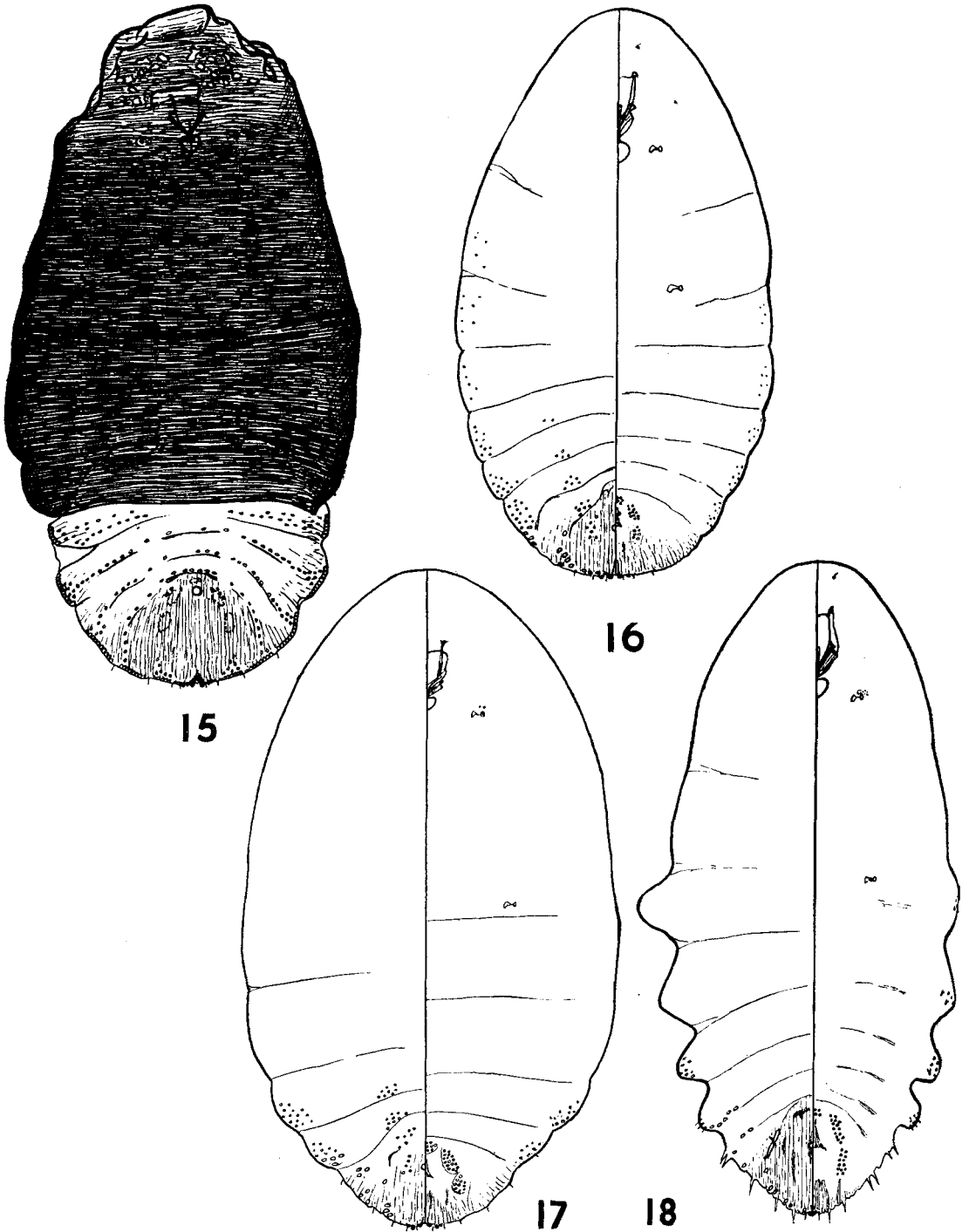


FIG. 15.—*Moraspis euphorbiae* (Brain)—genotype.  
 FIG. 16.—*Nelaspis exalbida* (Cockerell)—genotype.

FIG. 17.—*Nelaspis humilis* (Brain).  
 FIG. 18.—*Pinnaspis gossypii* (Newstead).

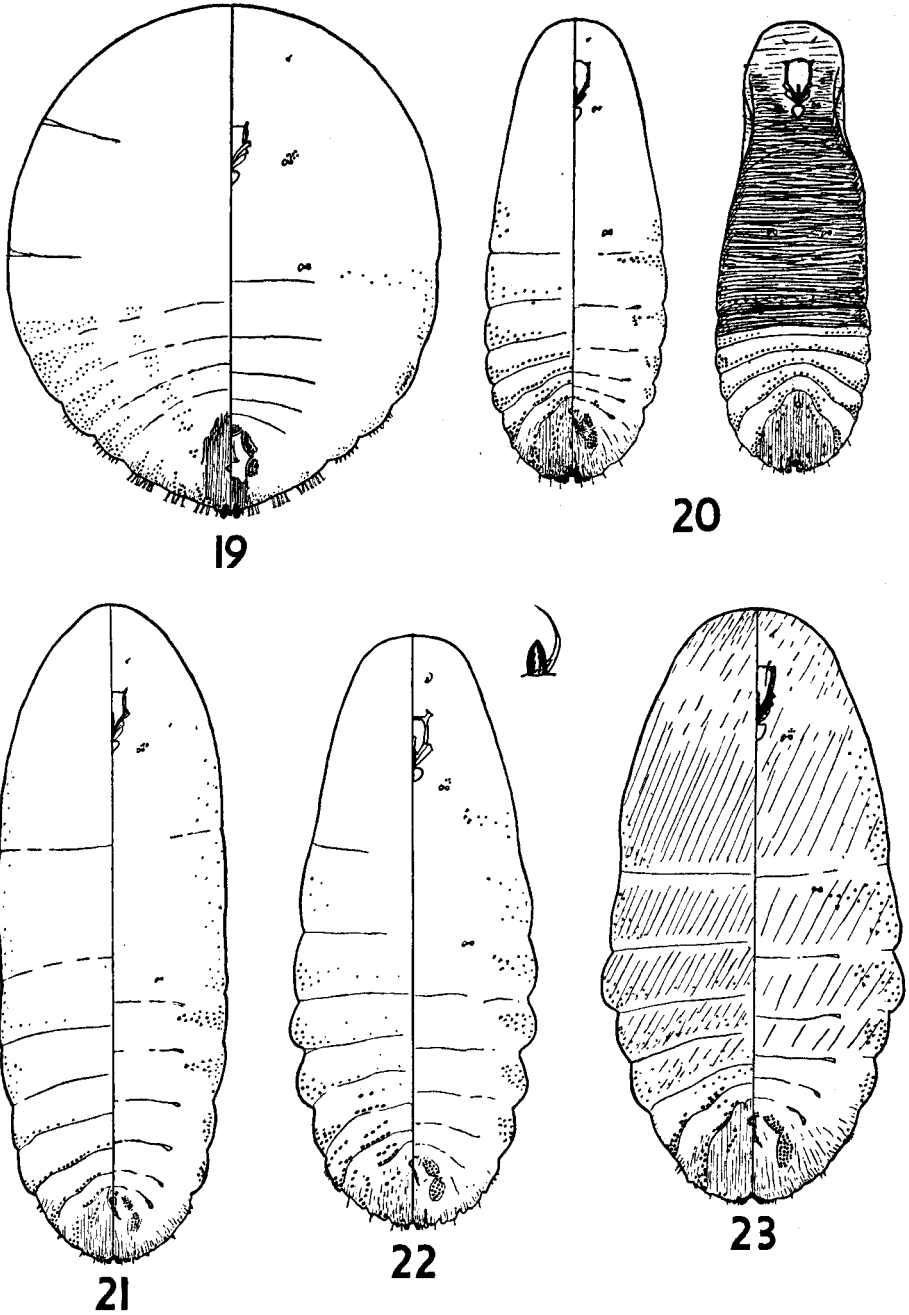


FIG. 19.—*Pudaspis newsteadi* (Leonardi)—genotype.  
FIG. 20.—*Rolaspis carissae* (Cockerell)—early adult ♀ on left, mature adult ♀ on right.  
FIG. 21.—*Rolaspis chaetachmae* (Brain).  
FIG. 22.—*Rolaspis compositae* sp. n.  
FIG. 23.—*Rolaspis leucadendri* (Brain).

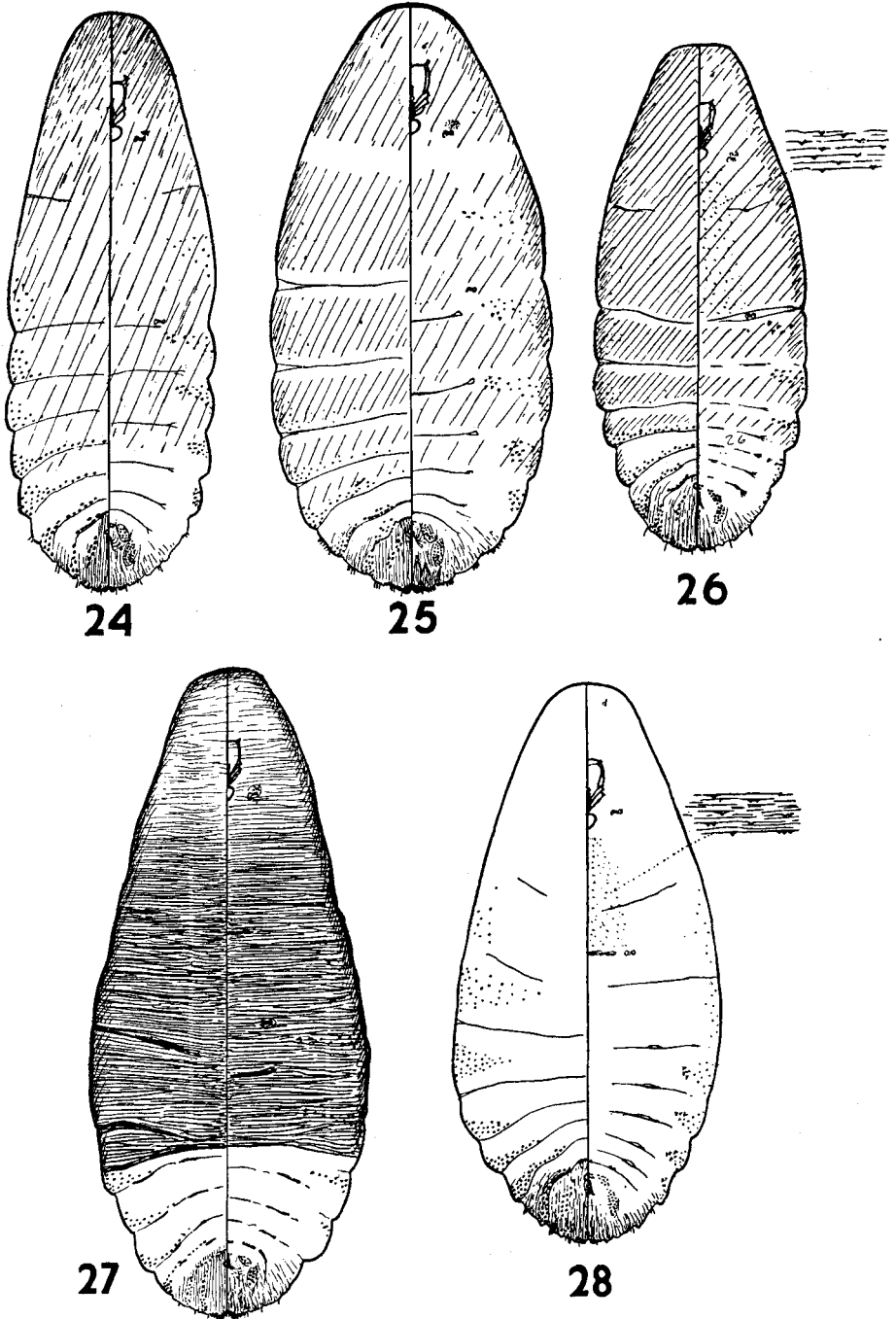


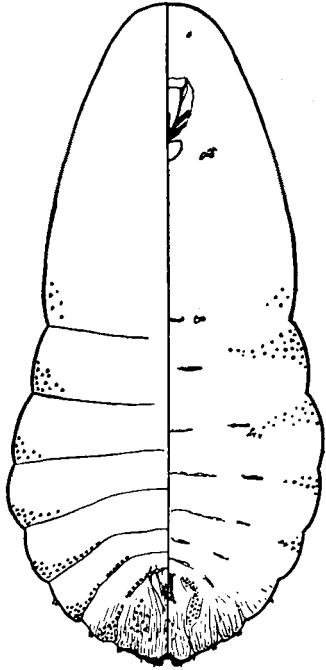
FIG. 24.—*Rolaspis lounsburyi* var. *ekebergiae* (Brain).

FIG. 25.—*Rolaspis munroi* sp. n.

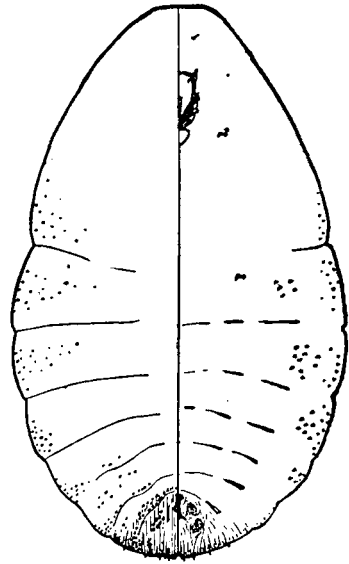
FIG. 26.—*Rolaspis spiculata* new name for *Chionaspis chaetachmae* var. *imbricata* Hall.

FIG. 27.—*Tecaspis kiggelariae* (Brain).

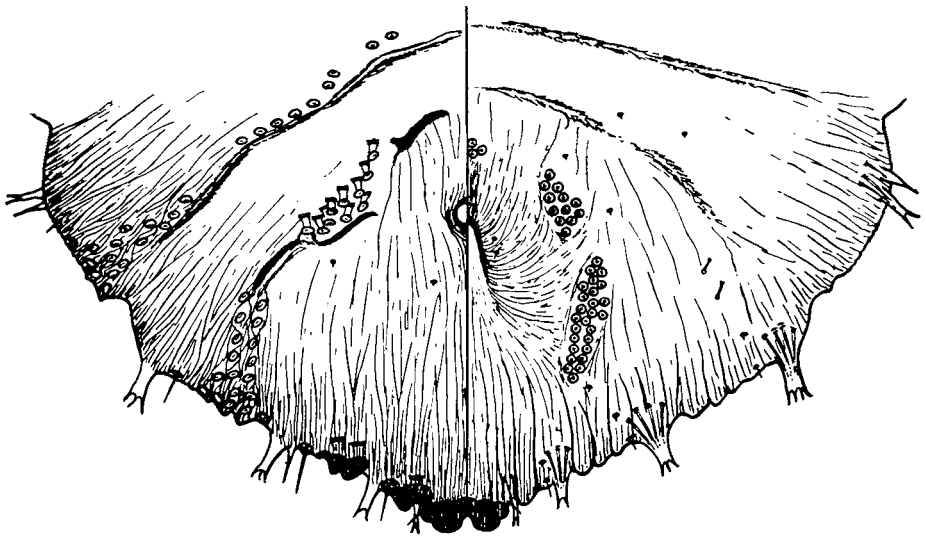
FIG. 28.—*Tecaspis mytilaspiformis* (Newstead).



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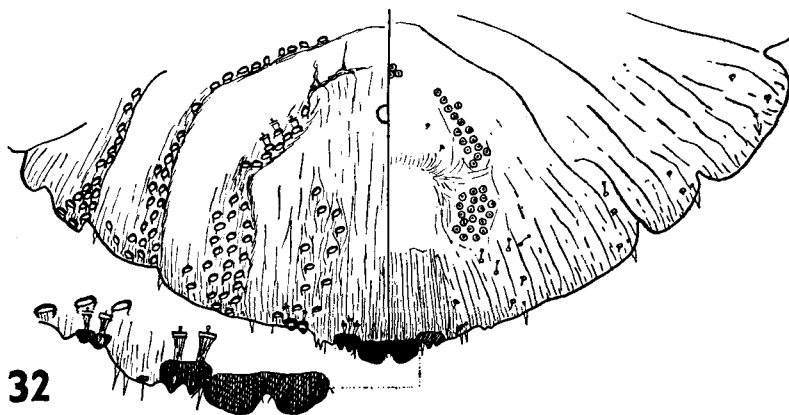


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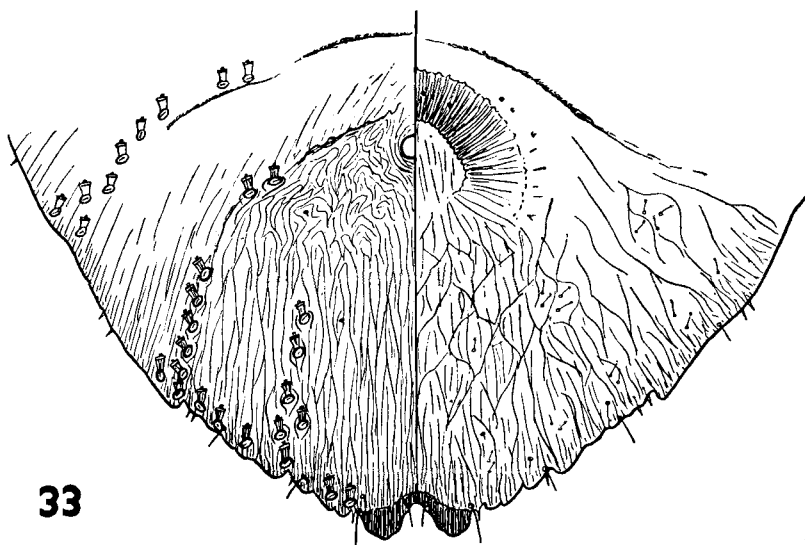


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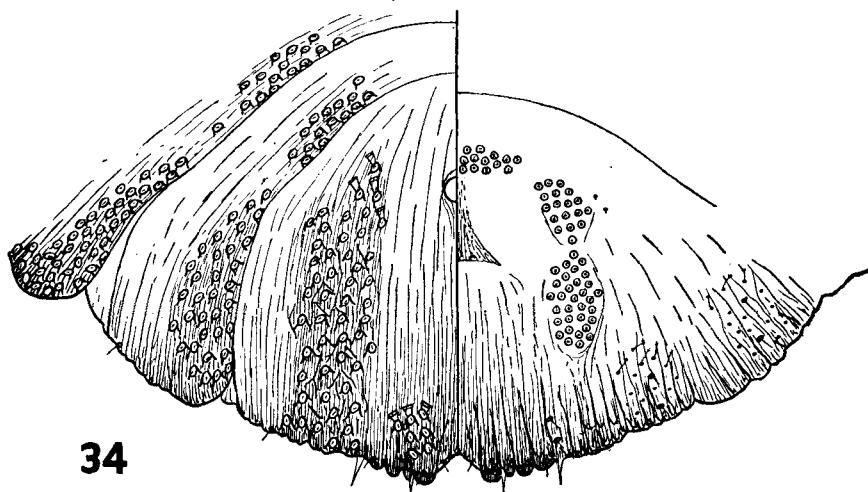
FIG. 29.—*Tecaspis visci* (Brain).  
FIG. 30.—*Voraspis nigerensis* (Vayssière).  
FIG. 31.—*Africaspis caffra* (Brain).



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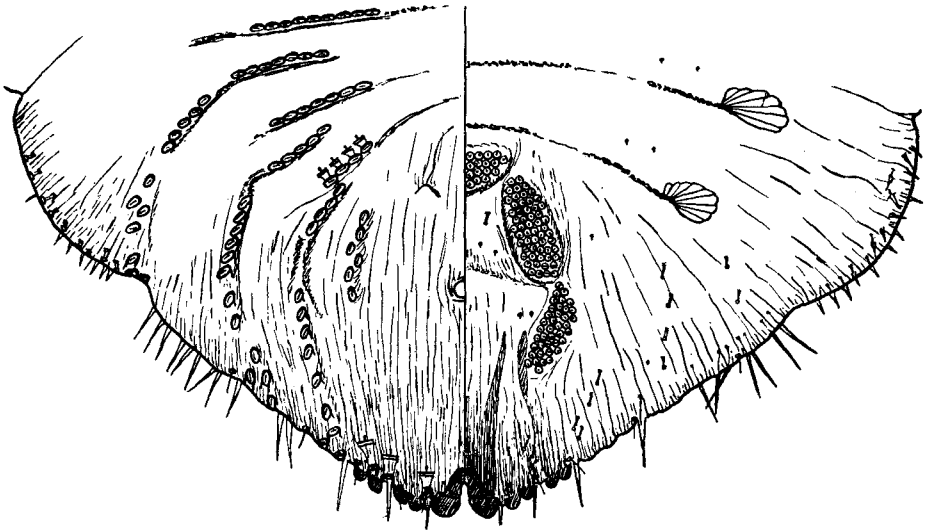
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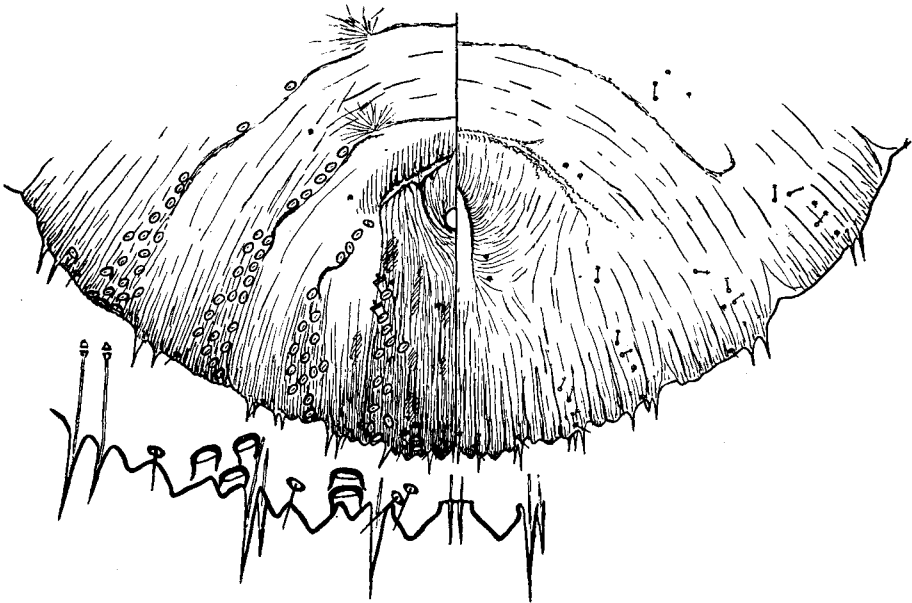
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FIG. 32.—*Africaspis scutiae* (Brain).  
 FIG. 33.—*Asymmetraspis distorta* (Newstead)—genotype.  
 FIG. 34.—*Augulaspis nudata* (Newstead)—genotype.





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FIG. 35.—*Aulacaspis fulleri* (Cockerell).  
FIG. 36.—*Balaspis faurei* gen. and sp. n.—genotype.

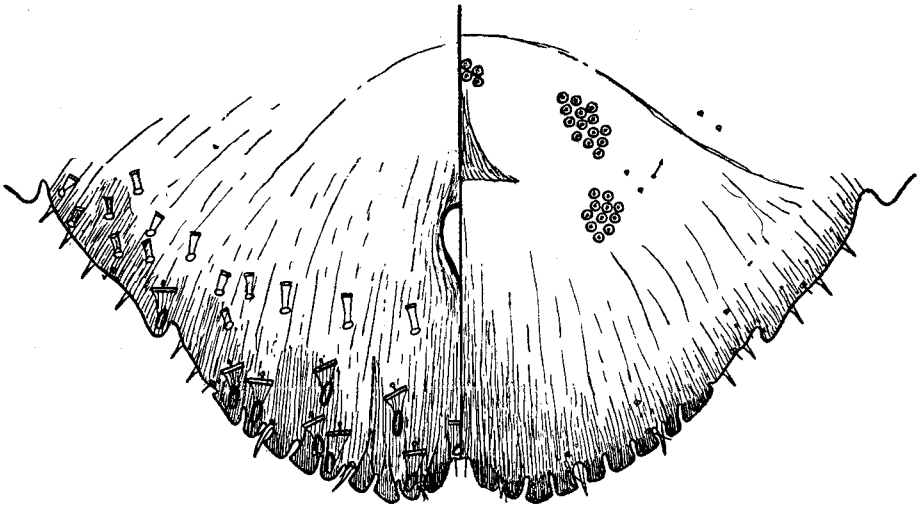
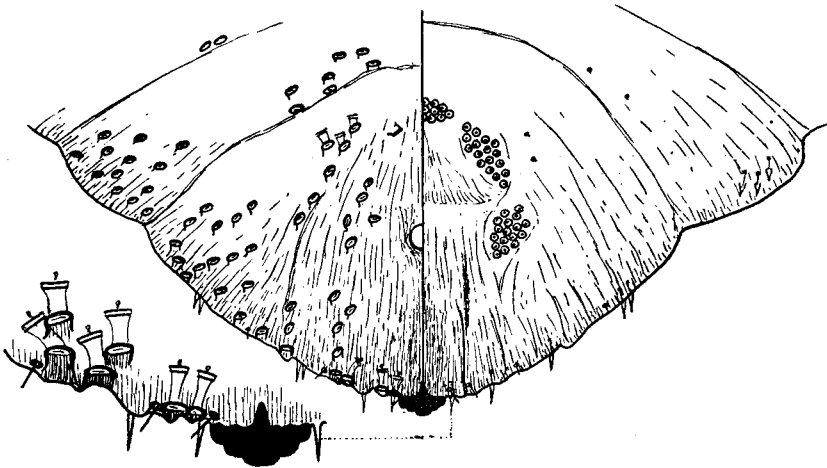
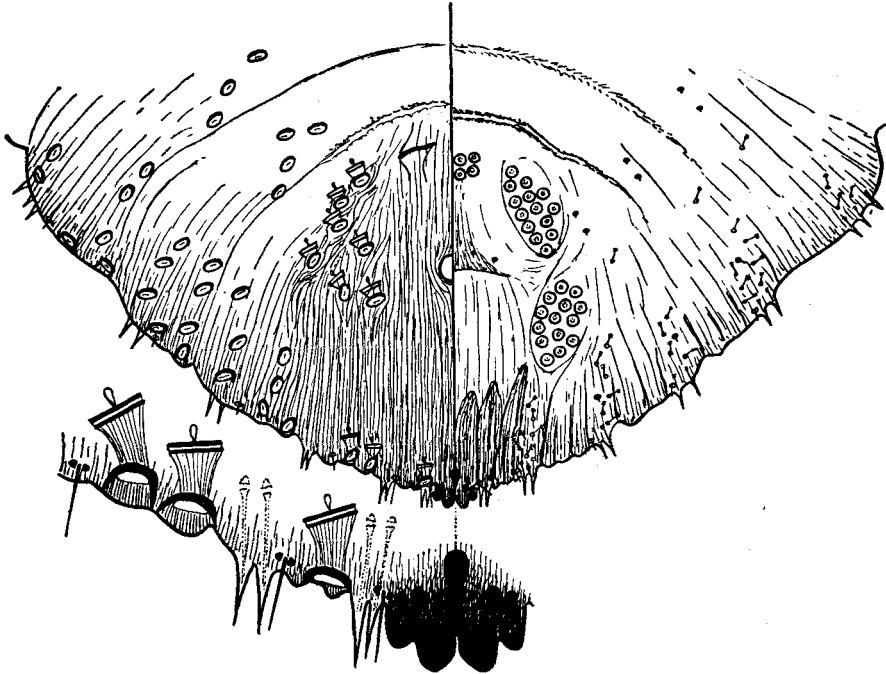
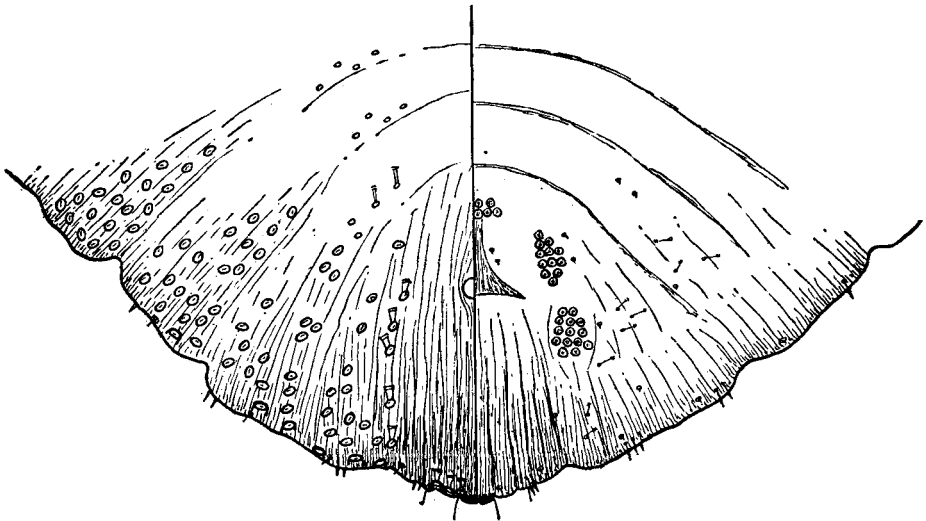
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FIG. 37.—*Chionaspis* "lutea" Newstead.  
FIG. 38.—*Contigaspis cyanogena* (Brain).

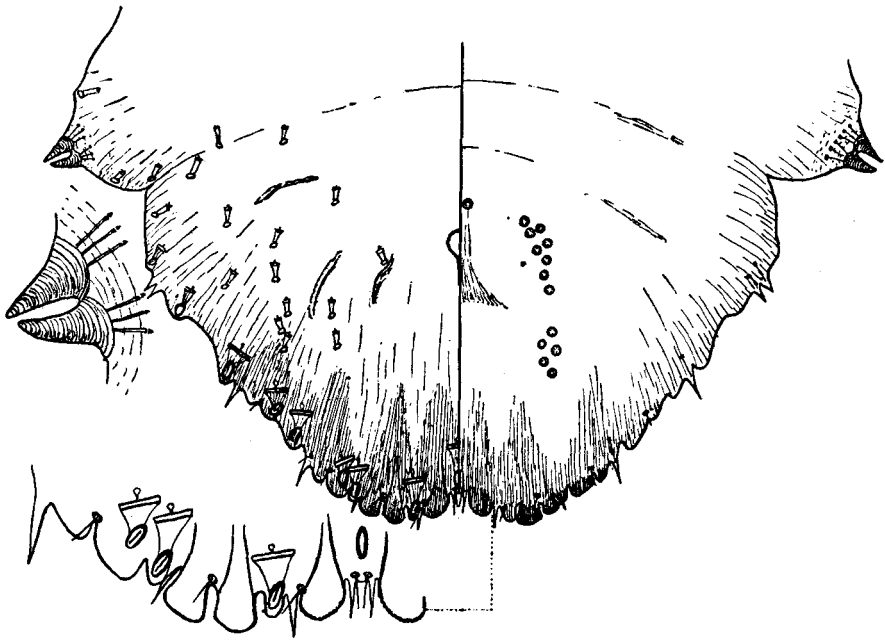


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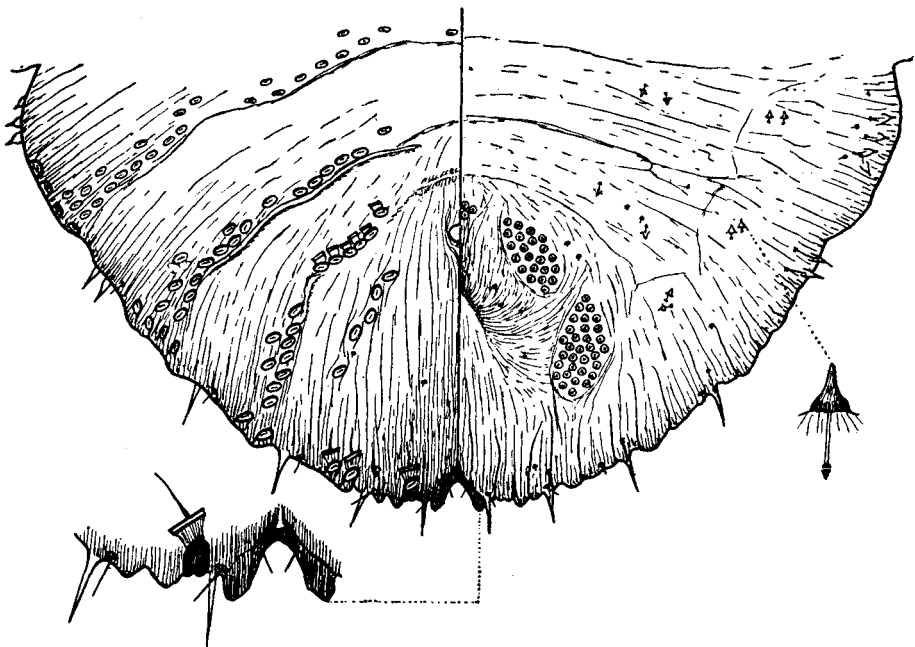


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FIG. 39.—*Contigaspis naudei* sp. n.  
FIG. 40.—*Contigaspis subnudata* (Newstead)—genotype.

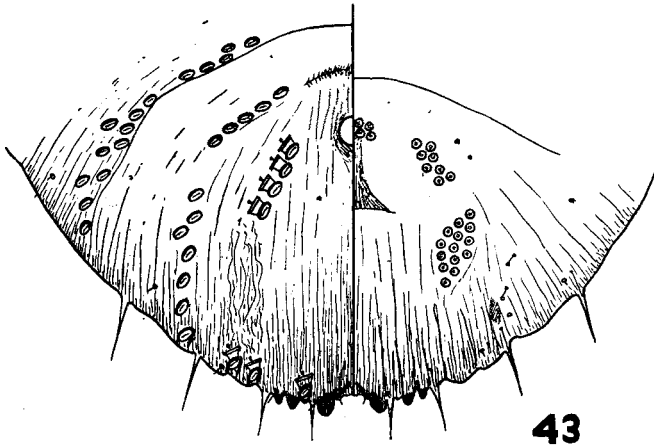


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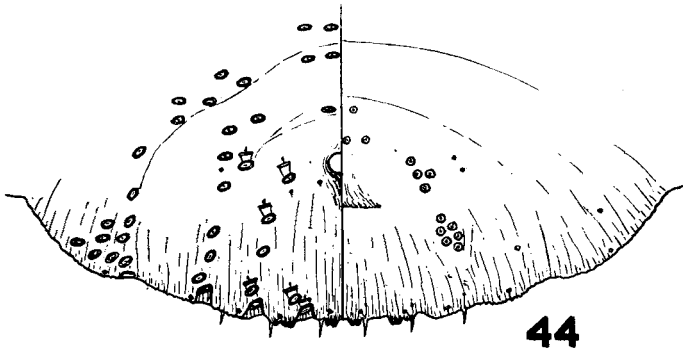


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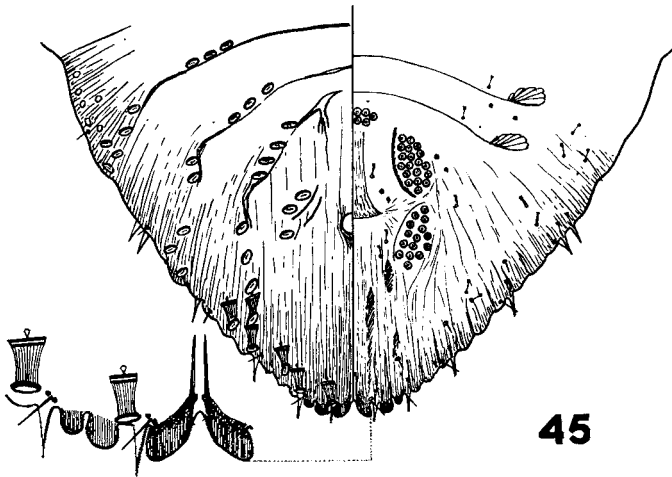
FIG. 41.—*Daraspis bussii* (Newstead)—genotype.  
 FIG. 42.—*Dentachionaspis margaritae* (Brain).



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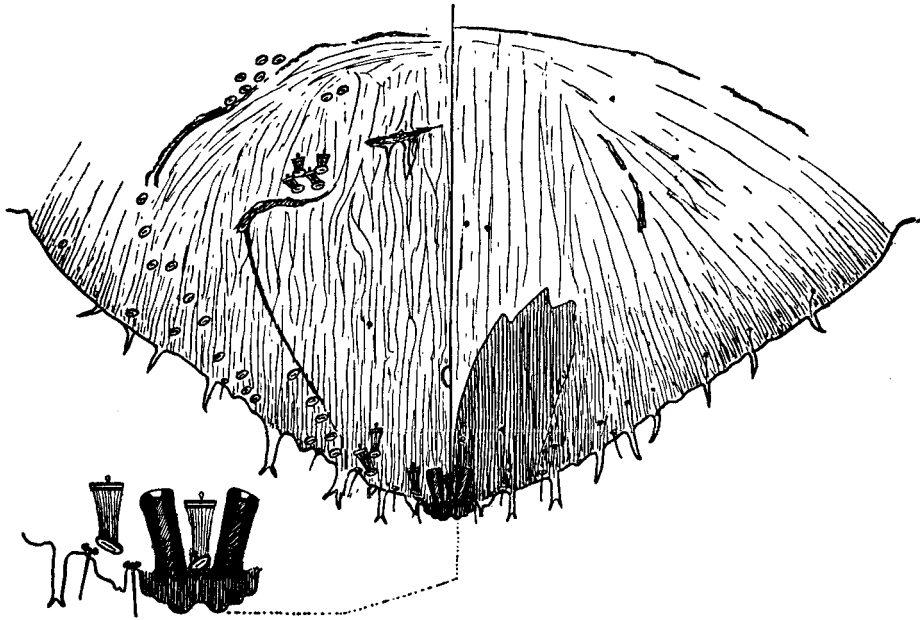


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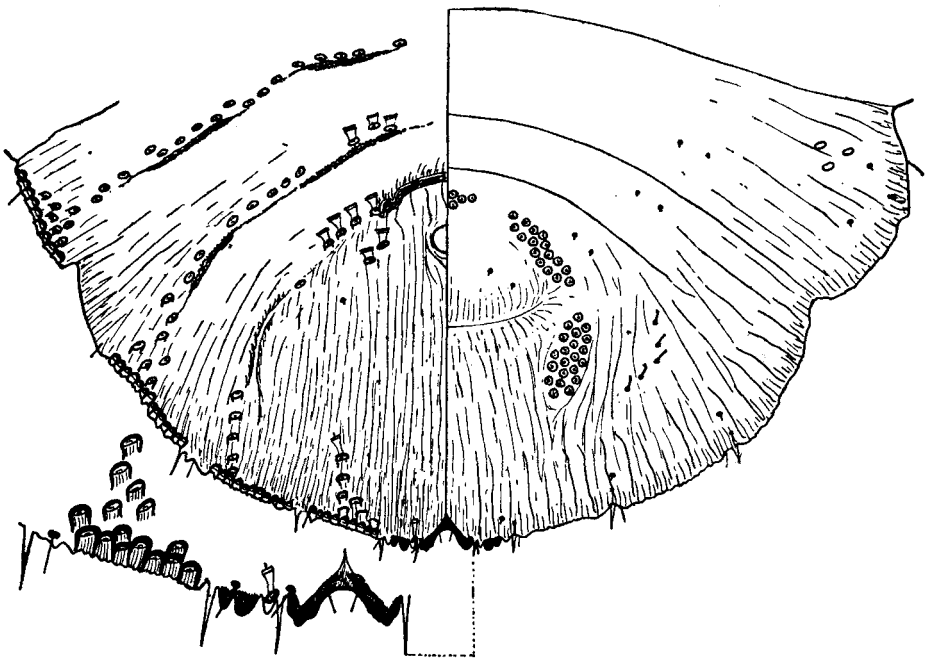


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FIG. 43.—*Dentachionaspis pseudonivea* (Malenotti).  
FIG. 44.—*Dentaspis globosus* (Brain).  
FIG. 45.—*Duplachionaspis stanotophri* (Cooley).

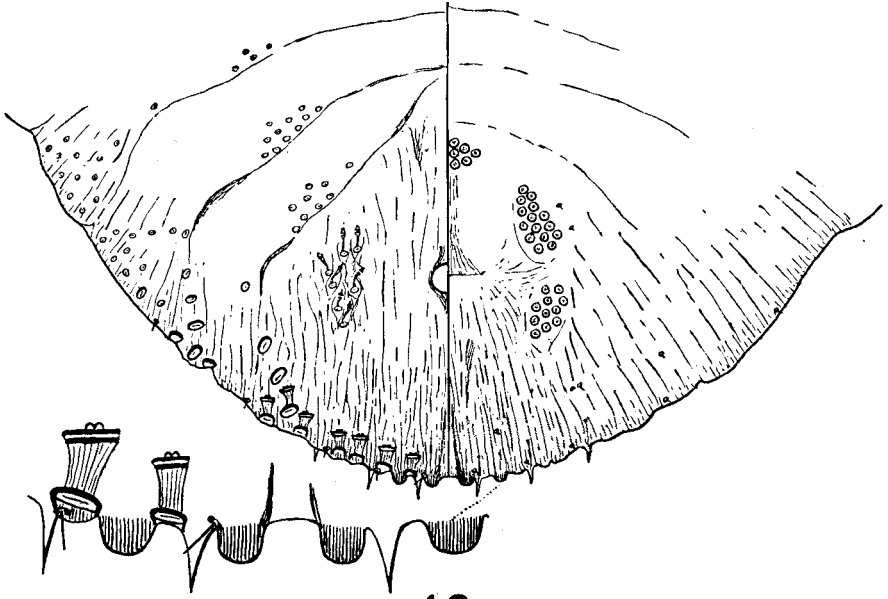


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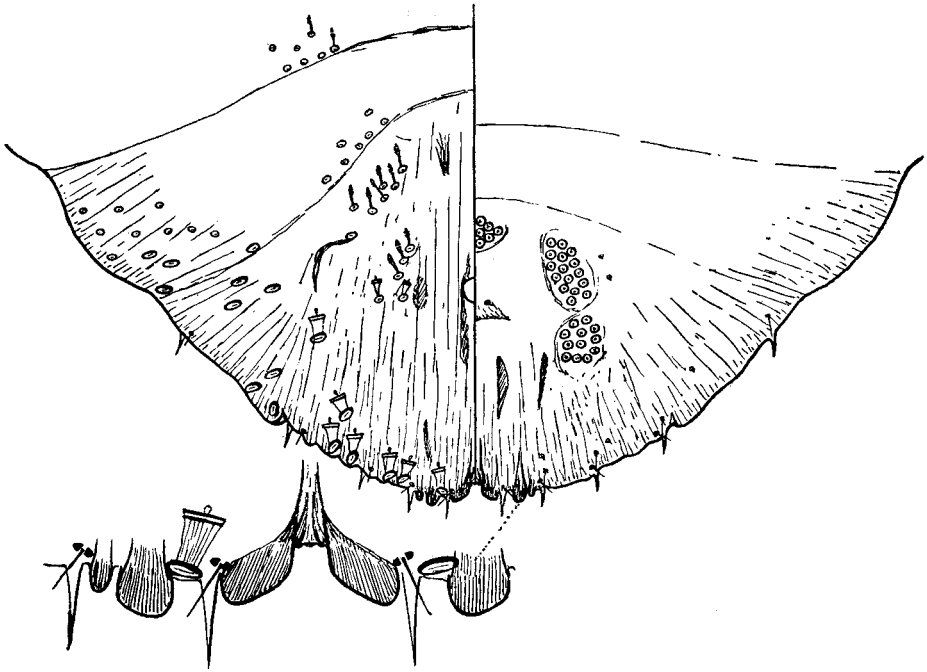


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FIG. 46.—*Hulaspis dombeyae* (Hall)—genotype.  
 FIG. 47.—*Moraspis euphorbiae* (Brain)—genotype.

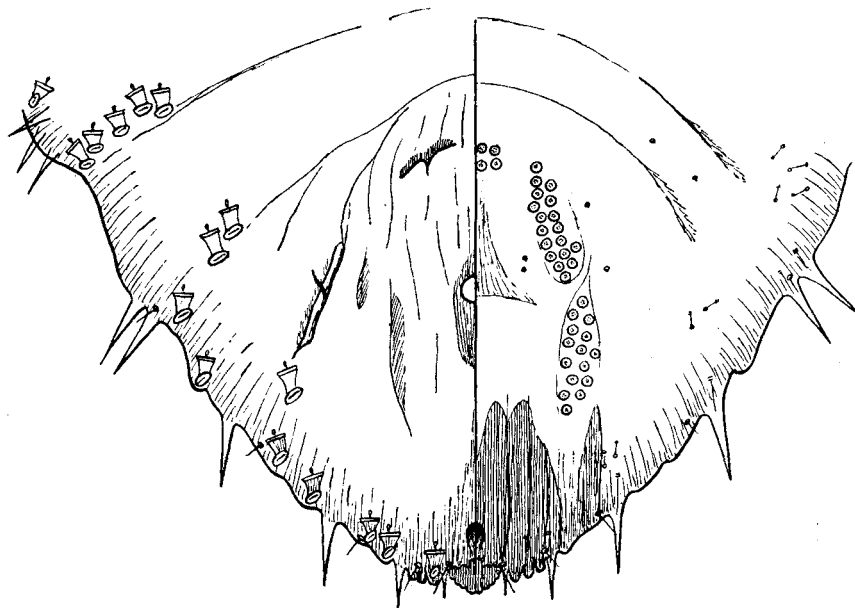


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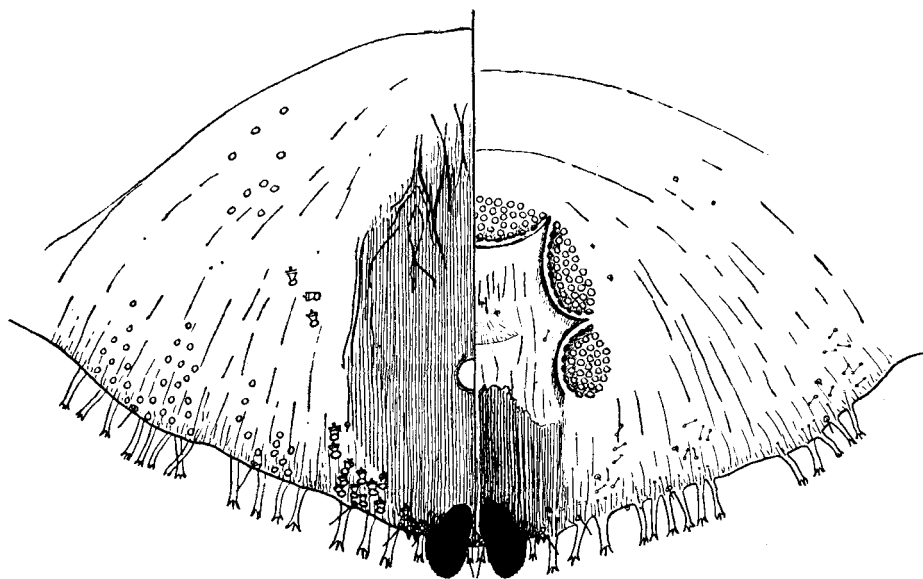


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FIG. 48.—*Nelaspis exalbida* (Cockerell)—genotype.  
FIG. 49.—*Nelaspis humilis* (Brain).



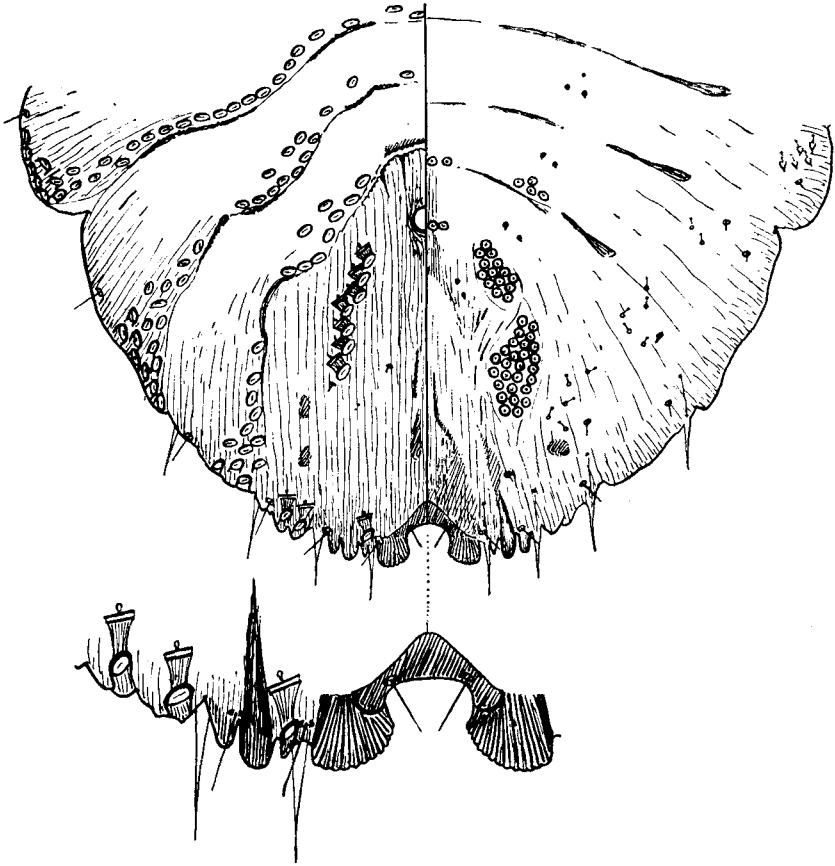
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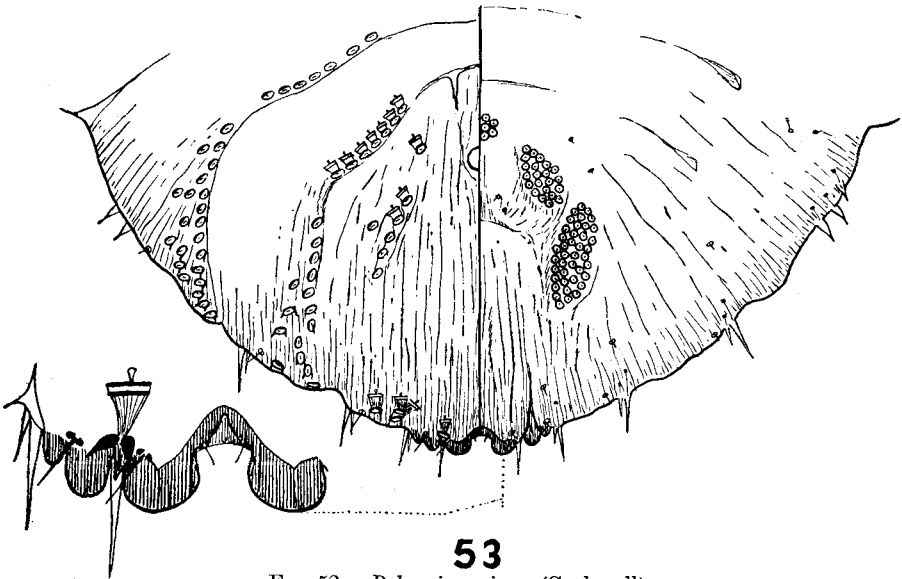
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FIG. 50.—*Pinnaaspis gossypii* (Newstead).  
 FIG. 51.—*Pudaspis newsteadi* (Leonardi)—genotype.



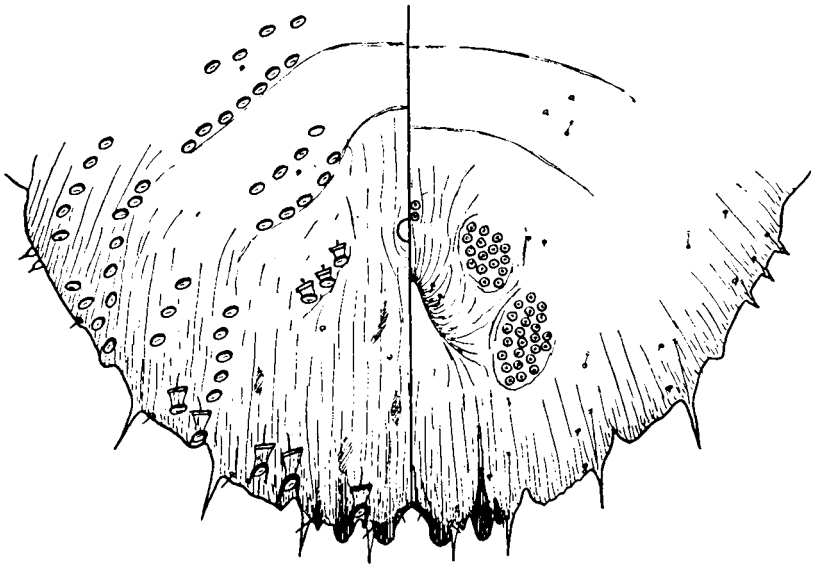


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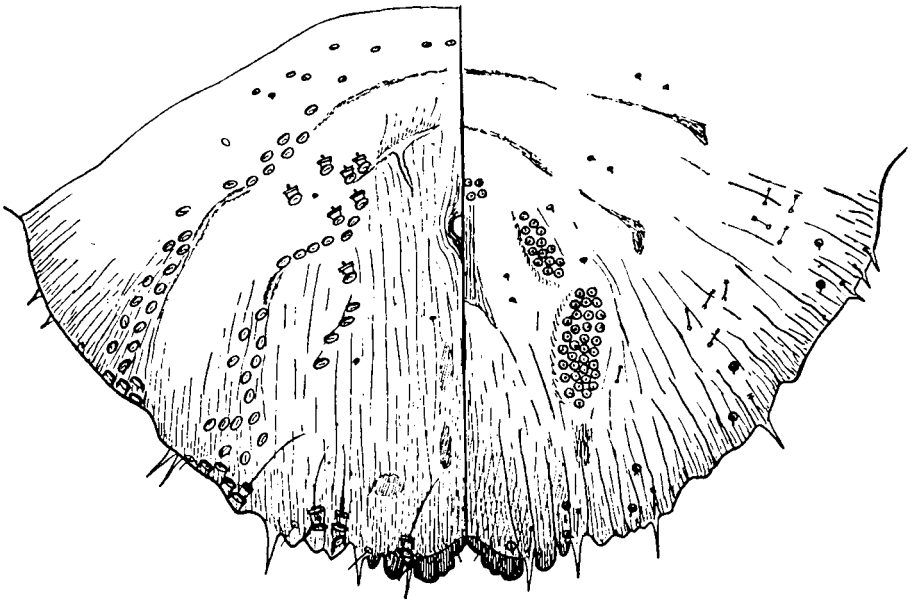


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FIG. 52.—*Rolaspis carissae* (Cockerell).  
FIG. 53.—*Rolaspis chaetachmae* (Brain).

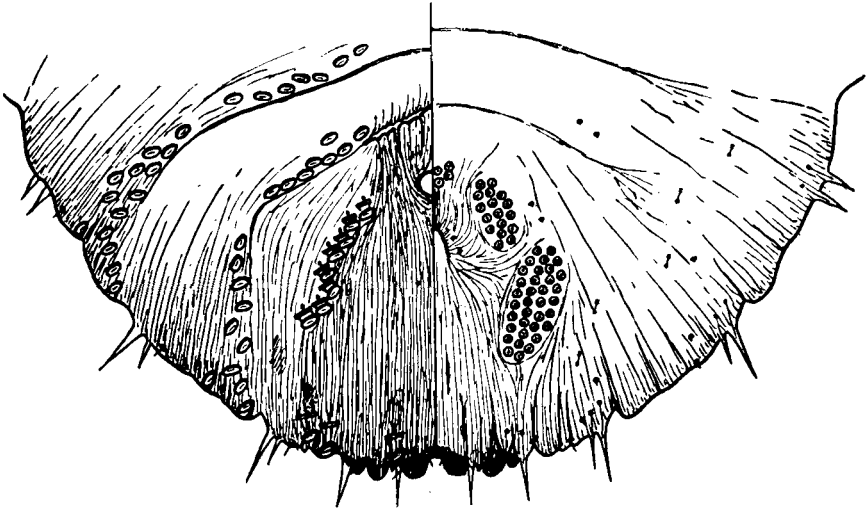


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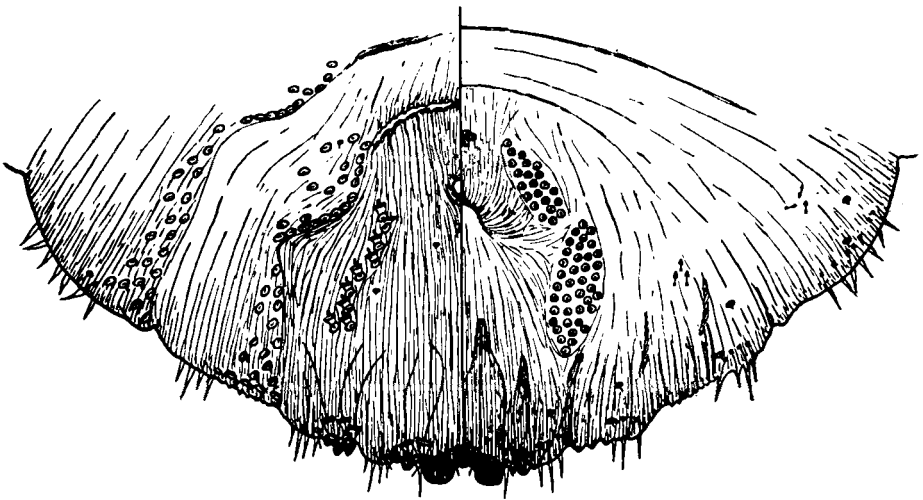


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FIG. 54.—*Rolaspis compositae* sp. n.  
FIG. 55.—*Rolaspis leucadendri* (Brain).

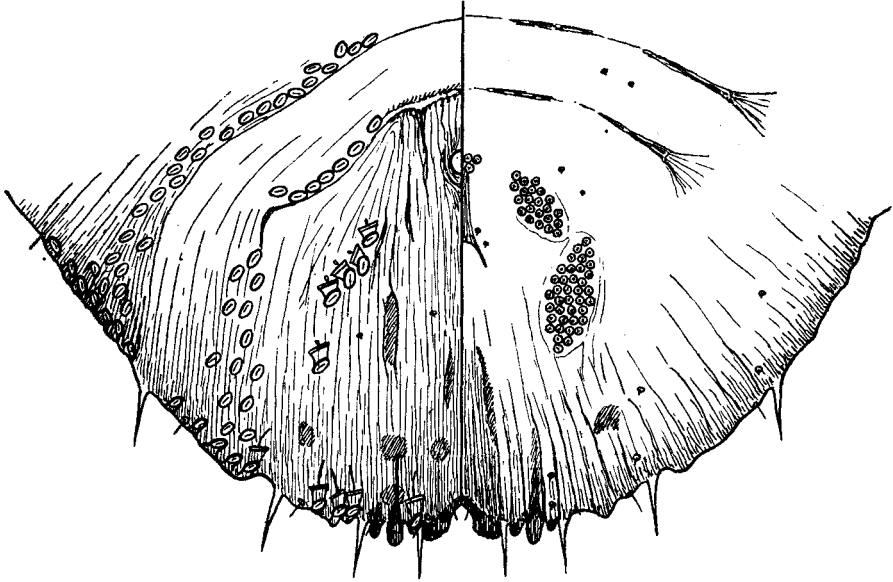


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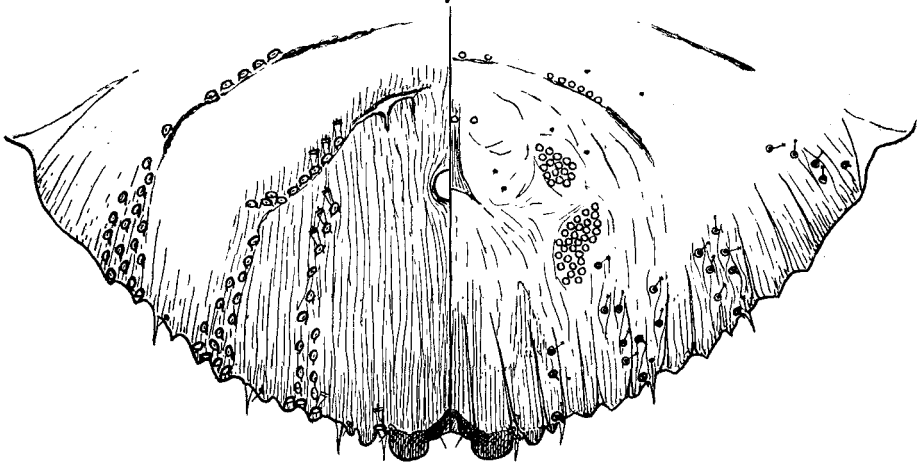


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FIG. 56.—*Rolaspis lounsburyi* var. *ekebergiae* (Brain).  
FIG. 57.—*Rolaspis munroi* sp. n.

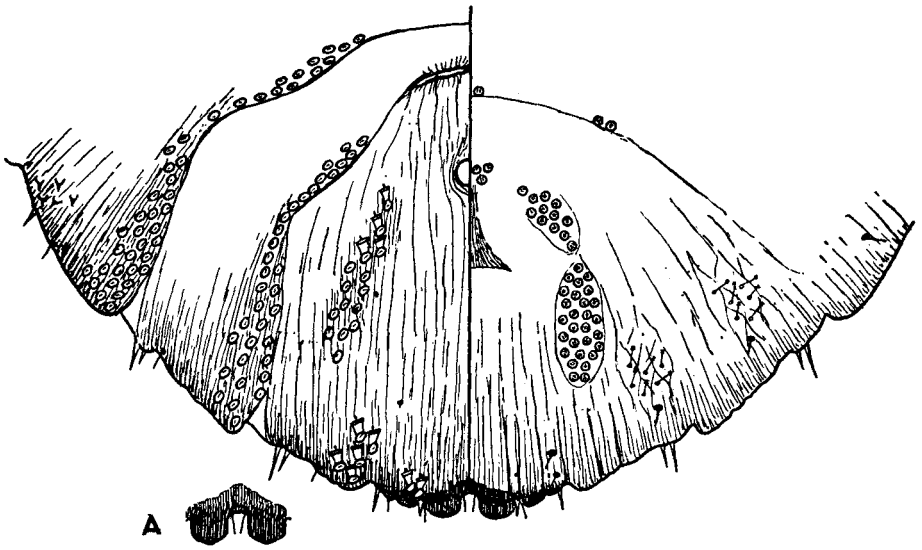


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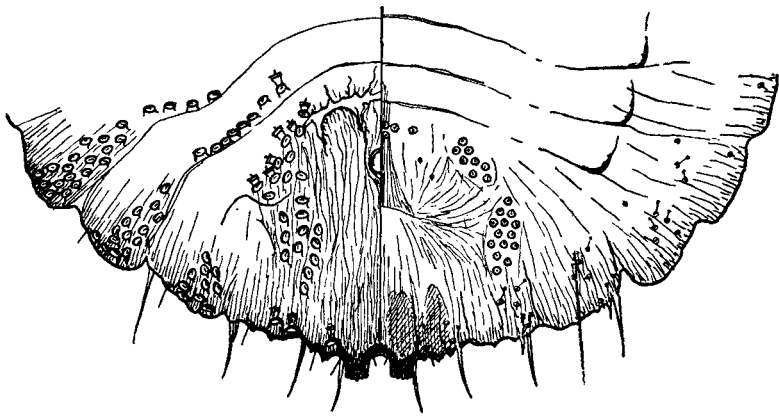


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FIG. 58.—*Rolaspis spiculata*, new name for *Chionaspis chaetachmae* var. *imbricata* Hall.  
 FIG. 59.—*Tecaspis kiggelariae* (Brain).

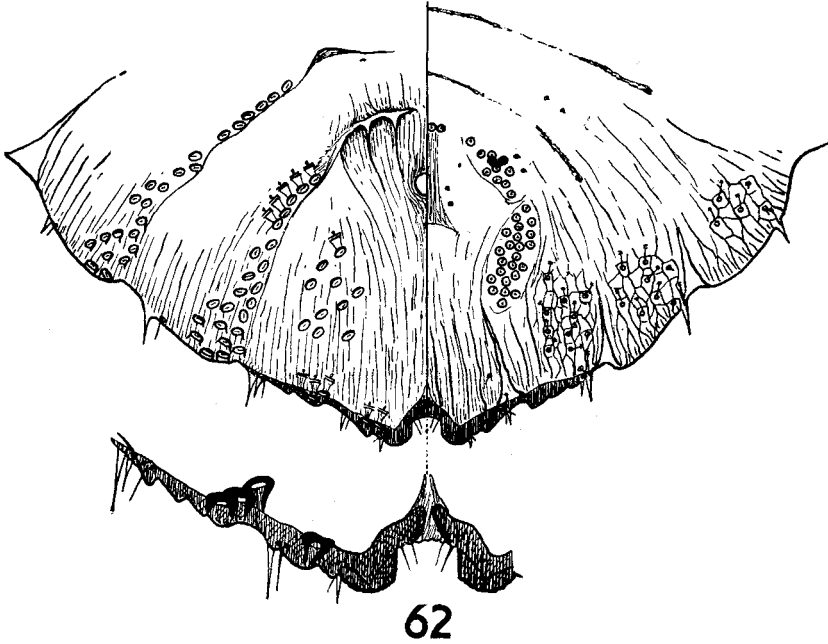


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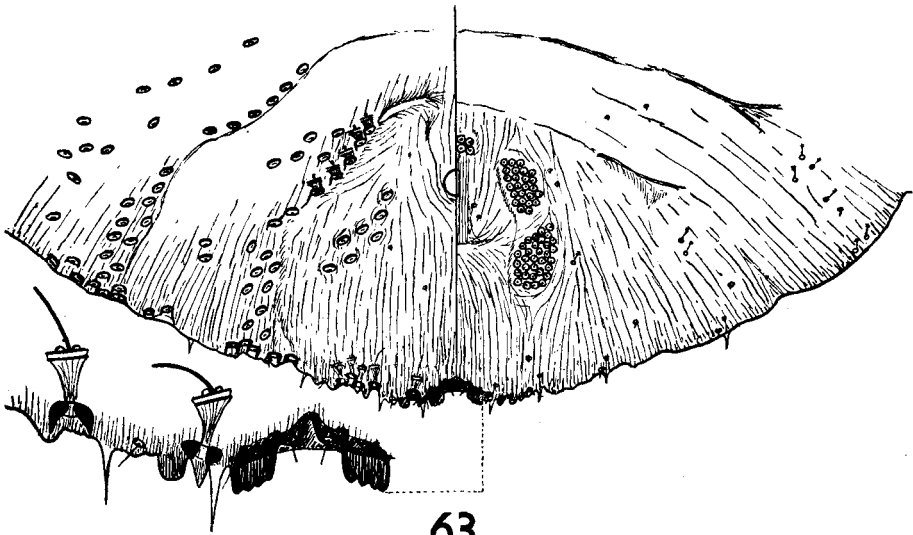


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FIG. 60.—*Tecaspis mytilaspiformis* (Newstead); A, variation in shape of median lobes.  
FIG. 61.—*Tecaspis retigera* (Cockerell).



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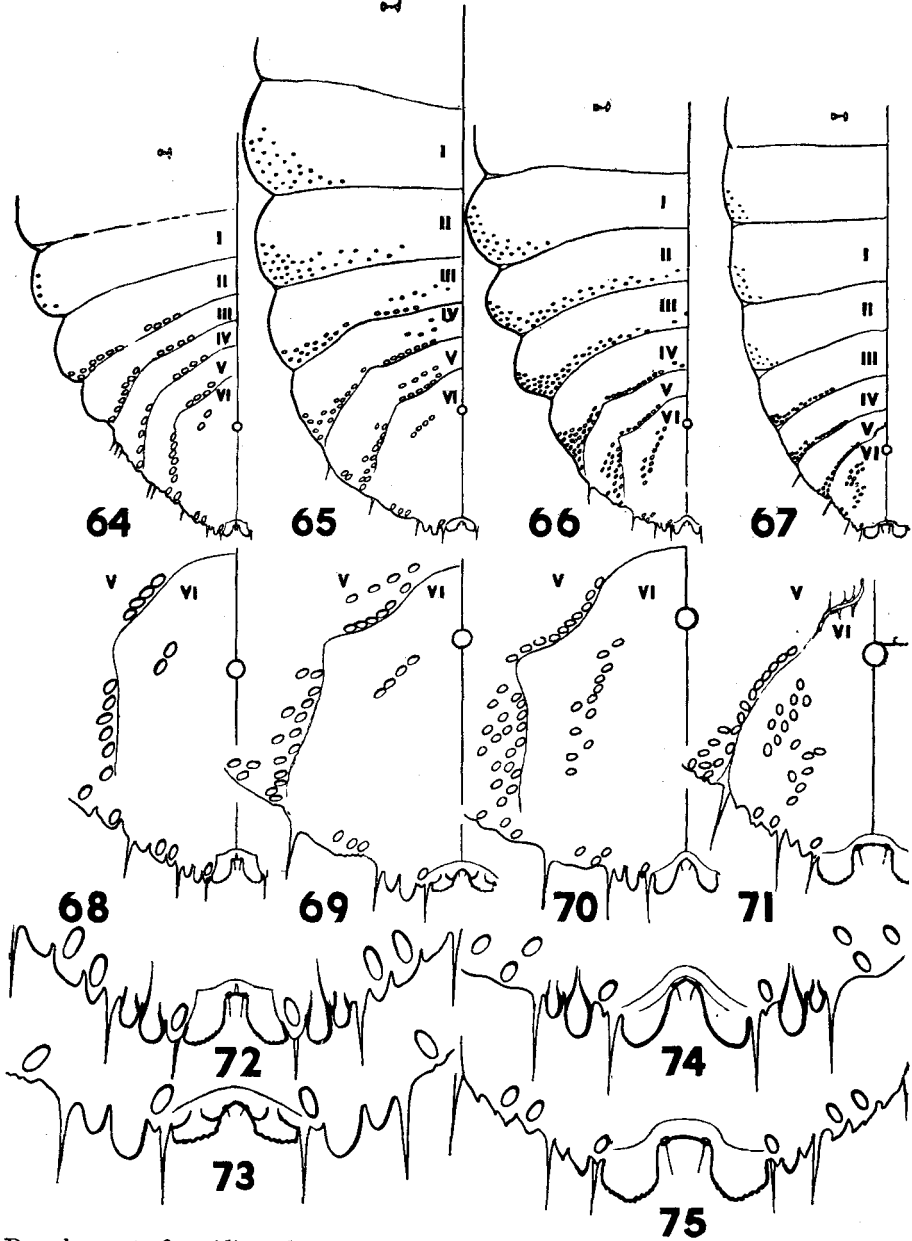
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FIG. 62.—*Tecaspis visci* (Brain).  
 FIG. 63.—*Voraspis nigerensis* (Vayssière).

Characters distinguishing the genera *Phenacaspis*, *Voraspis*, *Rolaspis* and *Tecaspis*.

Dorsal aspect of pygidium and prepygidial segments.

- FIG. 64.—*Phenacaspis dilatata* (Green).  
 FIG. 65.—*Voraspis carpenteri* (Laing).  
 FIG. 66.—*Rolaspis whitehilli* (Hall).  
 FIG. 67.—*Tecaspis umtalii* (Hall).



Dorsal aspect of pygidium showing the arrangement of dorsal pores on segments 5 and 6.

- FIG. 68.—*Phenacaspis dilatata* (Green).
- FIG. 69.—*Voraspiis carpenteri* (Laing).
- FIG. 70.—*Rolaspiis whitehilli* (Hall).
- FIG. 71.—*Tecaspiis umtalii* (Hall).

Median portion of pygidial fringe showing the median and second lobes.

- FIG. 72.—*Phenacaspis dilatata* (Green).
- FIG. 73.—*Voraspiis carpenteri* (Laing).
- FIG. 74.—*Rolaspiis whitehilli* (Hall).
- FIG. 75.—*Tecaspiis umtalii* (Hall).

The lengths of the actual specimens—all types—figured were as follows:—*Phenacaspis dilatata* (Green), 0.9 mm.; *Voraspiis carpenteri* (Laing), 1.85 mm.; *Rolaspiis whitehilli* (Hall), 2.2 mm.; *Tecaspiis umtalii* (Hall), 1.75 mm.