

***Cigarrophasma*, a new genus of stick-insect (Phasmatidae) from Australia**

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Abstract

An interesting new species of cigar-like appearance from Garradunga, north Queensland, Australia, is described in a new genus *Cigarrophasma*. The single representative, *C. tessellata* n.sp., is designated type species for the genus, which is similar in general appearance and allied to *Phasma* Lichtenstein, 1796. Brief notes are given on habits and life history.

Key words

Phasmida, *Cigarrophasma* new genus, *Cigarrophasma tessellata* new species, taxonomy.

Introduction

The Phasmida (stick and leaf-insects) is an order of approximately 3000 species, relatively poorly represented in museum collections, with many species described from unique specimens; consequently it is not surprising that the taxonomy is regarded as confusing, with new synonyms often reported in the literature (Brock, 1999). The Australian fauna is understudied. Vickery (1983) catalogued 98 Australian species; Balderson, Rentz & Roach (1998) listed an additional six species. Brock (1999) estimated that there are over 200 species in Australia. Over half of the described Australian fauna are found in Queensland, where this new species was located.

Material and methods

The present study deals with a new genus and species of Australian phasmid from the family Phasmatidae, first collected by Paul Hasenpusch and later also by Jack Hasenpusch (Garradunga, Innisfail, north Queensland) in the same rainforest habitat. Most of the type series has been deposited in the Queensland Museum, Brisbane [QM]. Several major museum collections in Australia were examined for material by me (curators or contact names in brackets): Australian National Insect Collection, Canberra [ANIC] (D.C.F. Rentz); Australian Museum, Sydney (S. Fellenberg); Darwin Museum & Art Gallery (G. Brown); Queensland Museum, Brisbane (G. Monteith); Western Australian Museum, Perth (T.F. Houston). The private collection of T. Hiller (Mt. Glorious, south-east Queensland) was also examined, along with many world-wide collections. However, no additional specimens were traced.

***Cigarrophasma* New genus**

Phasmatidae, Phasmatinae, Phasmatini

Description of genus

Large, fairly broad winged species. Head large, longer than wide, tuberculate; eyes average size, ocelli absent. Antennae long, but shorter than length of fore leg; basal segment broader than remaining segments.

Thorax broad in female. Pronotum slightly shorter than head, tuberculate, with central depression; Mesonotum approximately three times length of pronotum, with a variable number of large, brown, spine-like tubercles: the front pair are longer and broader than others, particularly in male, and curved forwards; there are a number of other spines, larger in male, and numerous tubercles. Metanotum shorter than mesonotum with smaller granulations. Fore wings long and ovate, much broader in female. Hind wings moderately

long, tessellated, dark brown and transparent. Legs robust and spiny, lobed in female, moderately long in male, shorter and broader in female. Fore legs considerably broadened in female. All femora with bold pair of apical spines, longer in male; and large subapical spines. Tibiae lobed in female. Tarsi of modest length, first segment of fore tarsi lobed in female.

Abdomen slender in male, end of anal segment slightly incised in centre. Subgenital plate swollen, raised in centre, then tapered to slightly rounded tip, exceeding end of 9th abdominal segment. In female body broader, 5th segment rounded laterally, 7th and 8th segments sometimes with large lateral leaf-like expansions towards end of segments. End of anal segment subtruncate; supra-anal plate visible, strongly triangularly incised in centre. Operculum broad, end slightly rounded, almost reaching end of anal segment. Cerci short in both sexes.

Type species: *Cigarrophasma tessellata* n.sp., here designated.

Distribution

Monotypic, Australian endemic, north Queensland.

Remarks on the genus

This genus has a similar appearance and is allied to *Phasma* Lichtenstein, but is easily distinguished from that genus by certain key features (Table 1). *Cigarrophasma* does not appear to be very closely related to existing genera in the tribe Phasmatini of the Phasmatinae, most of which have large, leaf-like cerci in one, or both sexes.

It is possible that this species belongs to a different tribe, as it differs from other genera in the Phasmatini by its shorter cerci and lack of ocelli in the male. However, apart from these features, it is very similar to *Phasma* in general appearance (and significantly differs from other tribes in the Phasmatinae, which have wings strongly reduced in the female) that I prefer to allocate it to the Phasmatini. This stance is further supported by general similarity in egg capsule shape and size. However, the eggs of *Cigarrophasma* lack the capsule sculpturing present in *Phasma*, whose capitulum is raised by a small stalk. The stalk is also absent in *Vetilia* Stål, which has a much larger capitulum than *Cigarrophasma*.

Paracyphocrania Redtenbacher, 1908 is possibly more closely related, but is only briefly described, based on a single 140mm specimen of *P. lativentris* Redtenbacher of unknown origin, which has since been destroyed. The description differs from this new Australian genus, although both have short cerci and tessellated wings. The new genus is much more tuberculate, with the lateral expansions on abdominal segments absent in *Paracyphocrania*, which has leaf-like cerci.

| Feature | <i>Cigarrophasma</i> | <i>Phasma</i> |
|--------------------|---|--|
| General appearance | Reasonably long (♀ up to 151mm) and broad, with numerous tubercles. Hind wings dark brown and transparent chequered. Ocelli absent. | Elongate (♀ up to 200 mm), with modest number of bold spine-like tubercles or spines. Hind wings yellow and black chequered. Male with ocelli present. |
| Legs | Modest size, very broadened in female and reasonably lobed. | Long and spiny; some lobation. |
| Cerci | Short in both sexes (1.5mm). | Large, leaf-like (up to 18mm). |

Table 1. Comparison of *Cigarrophasma* n.gen. and *Phasma* Lichtenstein.

Cigar Stick-insect

***Cigarrophasma tessellata* n.sp.**

Holotype ♂ (QM), Stone Creek, Garradunga, Innisfail, north Queensland, 6.i.1995, P. Hasenpusch. Paratypes (15): [Abbreviations used for collectors: JH = Jack Hasenpusch; PH = Paul Hasenpusch]. From same locality as holotype: ♂ 19.i.1995 PH (QM); 2♂♂ 2.ii.1995 PH (QM), ♀ 15.i.1993 PH (QM); ♀ 24.ii.1994 JH (QM), 3♂♂ 16.i.1994 JH (QM); ♂♀ 16.1.1994 JH (ANIC); 2♂♂ 24.ii.1994 JH (P.D. Brock); ♀ 12.xii.1992 JH (P.D. Brock); Polly Creek, Garradunga, Innisfail, north Queensland: ♂♀ 10.iii.1999 JH (P.D. Brock).

Description of male (Figures 1-3)

Attractive brown, medium-sized insect, with spiny tubercles on mesonotum and chequered wings; 108mm long.

Large, fairly broad winged species. Head large, longer than wide; eyes average size, ocelli absent. Central narrow white line, not reaching front of head. Hint of white line either side, reaching back of head, but only 1.5mm long. Head with numerous tubercles. Antennae long, but shorter than length of fore leg; basal segment broader than remaining segments.

Pronotum slightly shorter than head, with central depression; segment with many tubercles. Mesonotum three times length of pronotum, with numerous large brown tubercles; the front pair are longer and broader than others and curved forwards. Metanotum shorter than mesonotum with smaller granulations. Lateral margins of meso- and metathorax with series of small tubercles. Underside of thorax with small tubercles. Fore wings long and ovate. Pre-anal part of hind wings greenish brown; inner margin with black blotch surrounding triangular transparent area. Hind wings moderately long, reaching end of 6th abdominal segment; tessellated, dark brown and transparent. Legs robust and spiny, moderately long. All femora with bold pair of apical spines and large subapical spines. The mid and hind femora are much spinier than fore femora; same applies to tibiae.

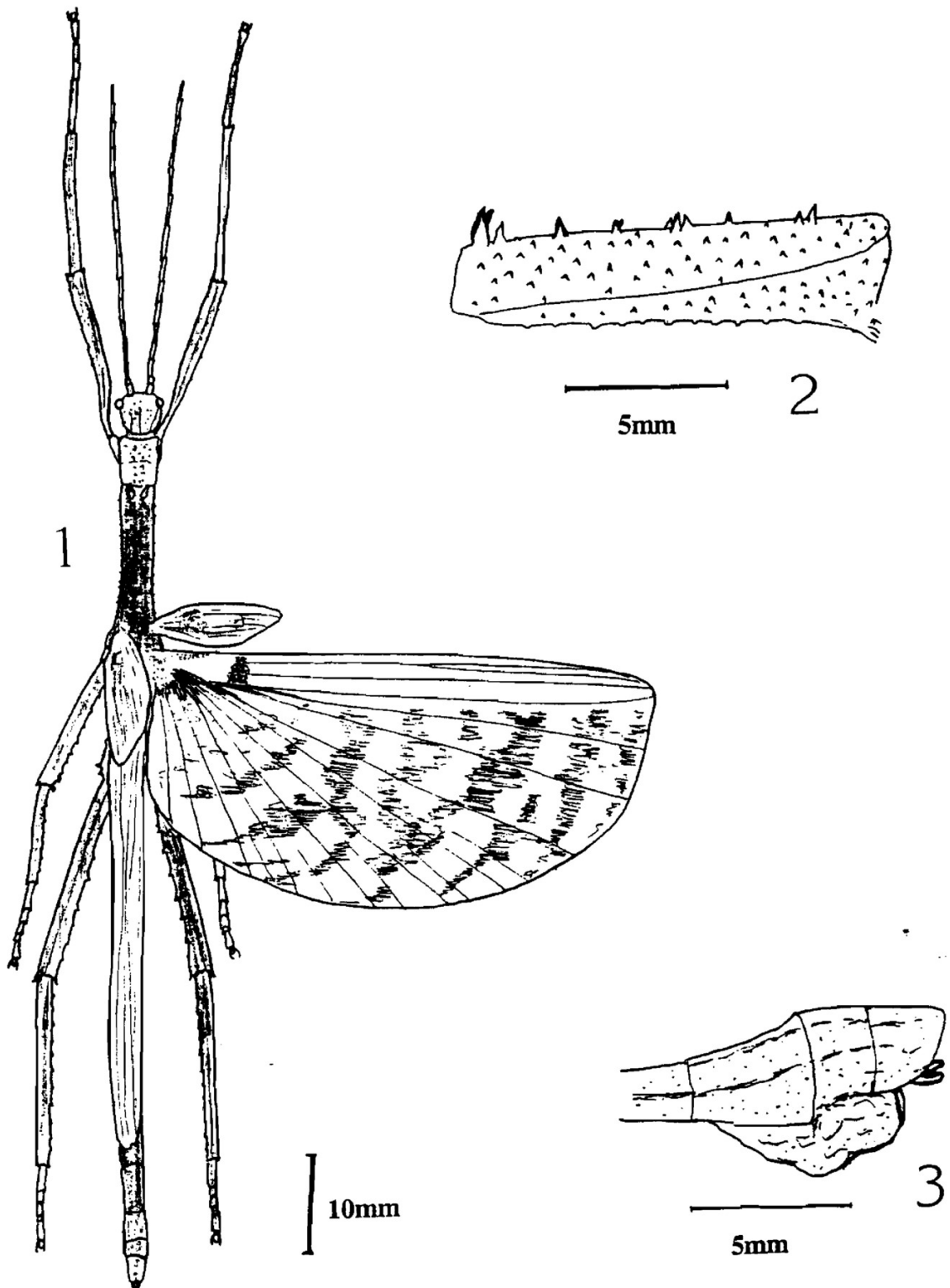
Abdomen slender, granulated and with various ridges, end of anal segment slightly incised in centre. Subgenital plate swollen, raised in centre, then tapered to slightly rounded tip, exceeding end of 9th abdominal segment. Cerci short and stout, incurved; rounded at tip.

Paratype males: Same description as holotype, but variable in size (see Table 2) and sometimes colour (see Remarks on the species).

Description of female (Figures 4-5)

Large, fairly broad-winged species. Head large, longer than wide, whitish; eyes brown, average size, ocelli absent. Head with numerous tubercles. Antennae long, but shorter than length of fore leg; basal segment broader than remaining segments.

Thorax brown, broad. Pronotum slightly shorter than head, with central depression, sometimes whitish, like head; segment with many tubercles. Mesonotum 3 times length of pronotum, with numerous brown tubercles; usually with two or three spines near front of segment broader and darker than others. Metanotum shorter than mesonotum with smaller granulations. Lateral margins of meso- and metathorax with series of small tubercles. Underside of thorax with small tubercles. Fore wings greenish brown (light or dark), broad and ovate. Hind wings almost reaching end of 5th abdominal segment; tessellated, dark brown and transparent. Legs robust and spiny, relatively short and broad with various lobes. Brown or brown and whitish speckled or blotched. Fore legs considerably broadened. All femora with pair of apical spines. Mid and hind femora with large subapical spines. Mid and hind femora lobed towards hind part of upper surface. Tibiae lobed; mid and hind tibiae



Figures 1-3. Male *Cigarrophasma tessellata*. 1. dorsal view of holotype; 2. lateral view of mesothorax; 3. lateral view of end of abdomen.

with pair of lobes near base and apice. Tarsi of modest length, first segment of fore tarsi broadened.

Abdomen broad with numerous tubercles on upper and underside. 5th segment rounded laterally, 7th and 8th segments with large, lateral leaf-like expansions towards end of segments (much shorter on 6th segment - expansions on 7th and 7th segments absent in one paratype). End of anal segment subtruncate; supra-anal plate visible, strongly triangular incised in centre. Operculum broad, end slightly rounded, almost reaching end of anal segment. Cerci broad, rounded at tip. Measurements are given in Table 2.

Description of nymphs

The nymphs are reddish brown throughout all stages, but colours vary (see remarks on page 10) depending on host food plants.

Table 2

| Lengths (mm) | Holotype ♂ | ♂ paratypes | ♀ paratypes |
|----------------------------------|------------|-------------|-------------|
| Body length | 108 | 93-102 | 134-151 |
| Head | 6 | 5-6 | 9-10 |
| Antennae (tips often broken off) | 30 | 30-32 | 33-36 |
| Pronotum | 5 | 4.5-5 | 8.5-9 |
| Mesonotum | 16 | 15-16 | 22-25 |
| Metanotum | 9 | 9 | 9-10 |
| Median segment | 5 | 5 | 8 |
| Fore wing | 16 | 15-16 | 25-28 |
| Hind wing | 60 | 52-60 | 58-65 |
| Fore femora | 21 | 19-21 | 21-23 |
| Mid femora | 17 | 15-17 | 17-19 |
| Hind femora | 25 | 22-25 | 22-25 |
| Fore tibia | 21 | 17-21 | 17-20 |
| Mid tibia | 15 | 12-15 | 13-15 |
| Hind tibia | 22 | 18-22 | 19-21 |
| Fore tarsi | 18 | 11-18 | 13-14 |
| Mid tarsi | 10 | 7-10 | 10-12 |
| Hind tarsi | 12 | 9-12 | 11-14 |
| Cerci | 1.5 | 1.2-1.5 | 1.5 |

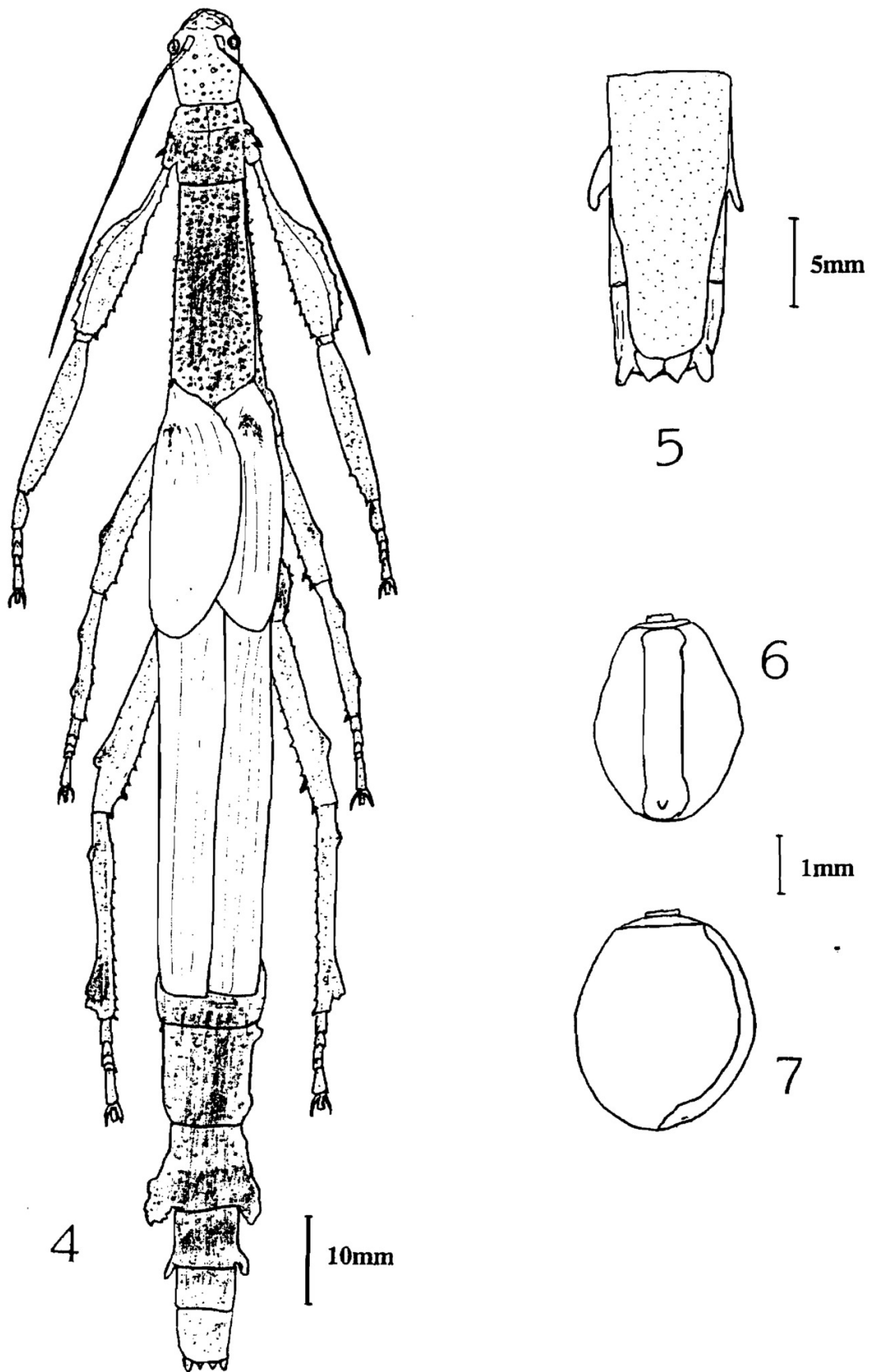
Description of egg (Figures 6-7).

Glossy, dark brown or black almost spherical capsule. Operculum flat, with short capitulum. Micropylar plate a large central whitish or brown band extending from operculum rim to the posterior pole. Capsule length 3.3mm, width 2.5mm, height 3mm.

Remarks on the species

Food plants include *Calliandra* (Mimosaceae), guava *Psidium* sp. (Myrtaceae) [neither native to Australia], *Cardwellia sublimis* and *Buckinghamia celcissima* (both Proteaceae). These insects are easy to rear in captivity, with eggs hatching in approximately four months. The nymphs mature in five months (for general rearing advice on phasmids, see Brock (1999)).

When disturbed, nymphs drop from the food plant and feign death by lying on the ground. Larger nymphs and adults tend to rest on a branch facing the main trunk of food plants. The body is kept raised well above the branch and the mid legs tucked underneath the body. The end of abdomen is typically raised, with a white spot at the end, resembling



Figures 4-7. *Cigarrophasma tessellata*. 4. Female, dorsal view; 5. End of abdomen, ventral view, 6. Egg, dorsal view, 7. lateral view.

bracken. Remaining motionless in the daytime and resembling their surroundings appears to be the main defence strategy. Adults have not been observed flashing their wings open; indeed, they hold onto branches tightly and are reluctant to move unless physically grabbed. Colour variation in adults and nymphs has been linked with colours of the host food plants in the wild; insects on *Calliandra* range from ashen grey to green, compared with purple-brown with deep green streaks when feeding on *Cardwellia*.

The known distribution is limited to Garradunga, near Innisfail, north Queensland. The male has previously been illustrated in a photograph, as an un-named species being set (Brock, 1999: 46).

Etymology

The genus is based on *cigarro* - cigar (due to the female's cigar-like appearance) and *phasma*, meaning apparition, on account of its affinity with the genus *Phasma*. The specific name *tessellata* relates to the mosaic patterned hindwings of this species. The common name 'Cigar Stick-insect' is an ideal name for this species.

Discussion

This is an interesting new species from Garradunga, belonging to the family Phasmatidae, in an understudied fauna. Brock (in press) describes two further species from the same locality. There still remain a number of interesting undescribed Australian species, including large insects. It is hoped that enthusiasts will try to record the life history and habits, which considerably add to our knowledge of genera.

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