

TASMANIA AND ITS MYRIAPODS

Bob Mesibov

P.O.Box 700, Burnie, Tasmania, Australia 7320.

INTRODUCTION

In common with other southern temperate lands, Tasmania has a rich litter fauna in which myriapods figure prominently. Perhaps 80% of the Tasmanian myriapod species remain undescribed, a proportion about the same as that for temperate parts of mainland Australia.

Pauropods and symphylans are common here but very little studied. Chamberlin (1920) described the symphylan *Tasmaniella hardyi* from Tasmania and in an unpublished 1989 report, Simone Rushton distinguished several additional symphylan species from rainforest patches around the island.

I recently summarised the available information on Tasmanian centipedes in an illustrated popular guide (Mesibov, 1986). Several new species have subsequently been discovered (see below) and there are many more locality records. Names are available for seven of the perhaps 30 native species.

I hesitate to guess how many species of millipedes are native to Tasmania, but judging from the rate at which new forms have been recognised since C.A.W. Jeekel published an overview (1981), the total is probably greater than 150. Only 20 have names.

In what follows I review current knowledge of Tasmanian centipedes and millipedes. Readers interested in particular groups are welcome to write to me for additional information.

GEOGRAPHICAL OVERVIEW

I begin with a geographical introduction to Tasmania.

Tasmania is a State within the Commonwealth of Australia (Fig. 1) and consists of a main island and several smaller islands with a total area of c.68 000 sq.km.

Physiography of the main island is complex, with numerous mountains, high plateaux, coastal and inland plains, lakes and a dense drainage network of rivers and streams. The highest peaks reach c.1600m and much of the island's centre is an extensive plateau over 900m in elevation.

Tasmania has a marine temperate climate with westerly winds prevailing. Annual mean daily temperatures in coastal locations

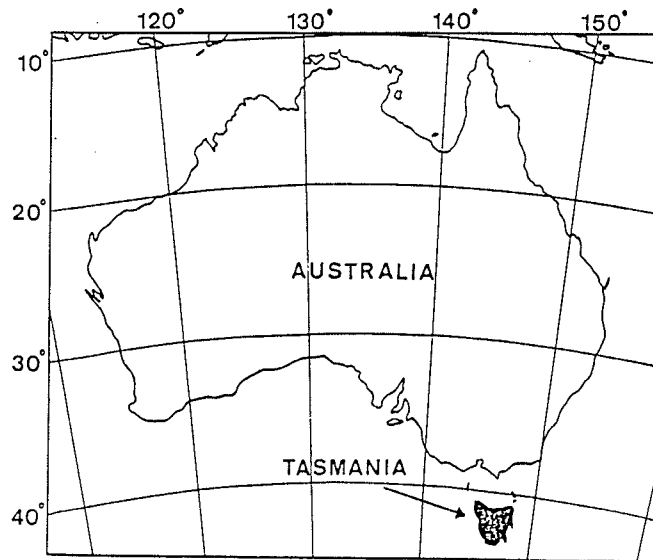


Figure 1. Location of Tasmania.

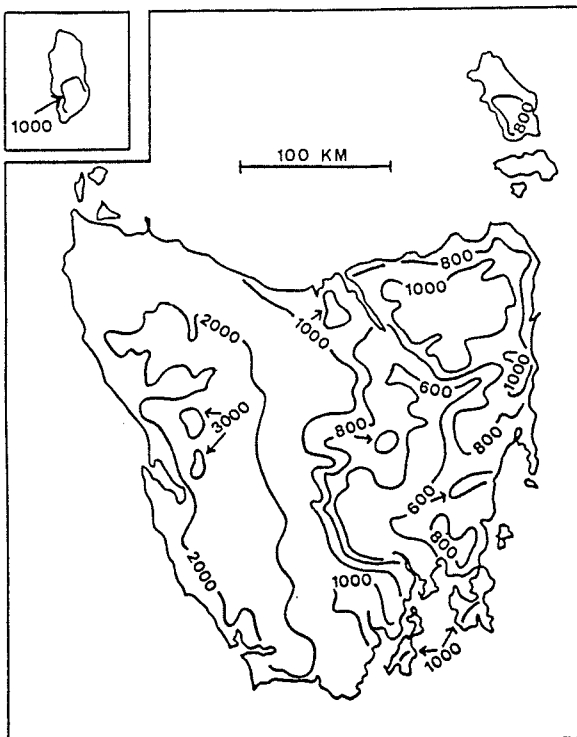


Figure 2. Annual rainfall. Isohyets in millimetres.

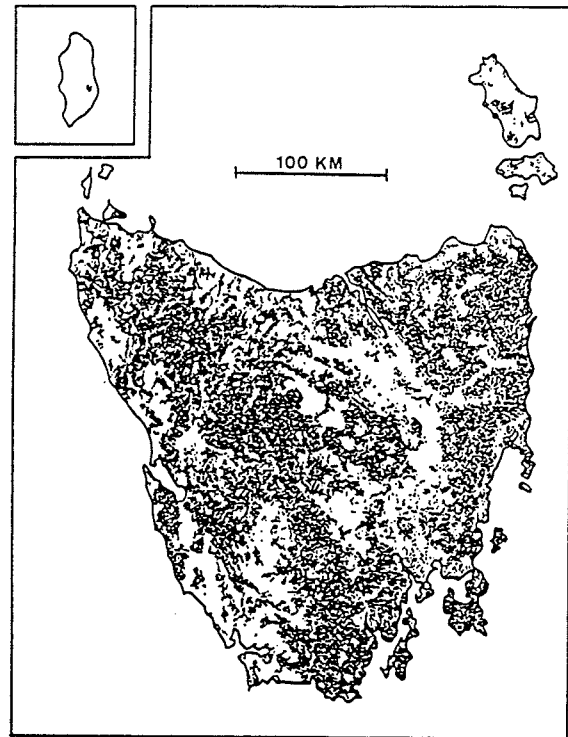


Figure 3. Distribution of forest and woodland. Non-stippled areas include low scrub, heath, moor, cleared land and lakes. After Kirkpatrick & Brown (1991).

are in the range 6-10°C for minima and 13-18°C for maxima. Annual rainfall (Fig.2) ranges from 500-600 mm in the east to c.3500mm in the west, with 70% of the State recording at least 800 mm/yr. Over most of Tasmania rainfall has a pronounced winter maximum. Prolonged dry spells are infrequent.

The natural vegetation of Tasmania is a complex mosaic of *Nothofagus* rainforest, wet and dry eucalypt forest and dry eucalypt woodland, with scrub, heath and moor at both high and low elevations. Forest and woodland cover is extensive (Fig. 3).

Tasmania experienced several highland glaciations during the Pleistocene. Evidence for human occupation dates back c.30 000 years, well before the last glaciation, and aboriginal Tasmanians lived in most parts of the main island when European colonists arrived in 1802. The Tasmanians were hunter-gatherers and are thought to have frequently burned dry forest, woodland, heath and moor. The resulting fresh green growth attracted and supported large populations of game.

Today about 60% of Tasmania is public land devoted mainly to forestry or nature conservation. Of the 40% in private hands, c.9000 sq.km. are cropland and sown pasture. Forestry plantations total c.1000 sq.km, mainly on private land.

CENTIPEDES

Scutigeroforma

Our only species is the introduced *Scutigera coleoptrata*, which is strictly anthropophilic and largely unknown outside the larger towns. As in England, *S. coleoptrata* prefers the damper parts of heated buildings.

Lithobiomorpha

The Lithobiidae are represented in Tasmania by two introduced species, *Lithobius microps* Meinert and *L. peregrinus* Latzel. Both are anthropophilic although there is a credible record of *L. peregrinus* from eucalypt forest near a fishing shack settlement in the east of the State.

By far the most common and widespread lithobiomorph in both southeastern Australia and New Zealand is the hemicopid *Hemicops maculatus* Newport (see Anonymous, 1982 for name). In Tasmania this species or species complex can be found in every habitat from coastal dunes to rocky mountaintops and from native grassland to dense rainforest. Although extremely fast-running and hard to collect by hand, *H. maculatus* is trap-mad and invariably dominates the centipede component of Tasmanian pitfall collections.

In my 1986 guide I called another native hemicopid 'Wailamyctes sp.' because of its resemblance to New Zealand members of that genus. Peter Johns subsequently wrote to me pointing out that he

had synonymised *Wailamyctes* with *Haasiella* more than 20 years earlier (Johns, 1964). I also mistakenly reported that our native *Haasiella* was restricted to rainforest in western river valleys. More recent collecting has shown that the species is widely distributed in forest in the north and west of the State. I stand, however, by my 1986 claim that this centipede is 'extremely elusive'. It prefers very deep litter and large rotting logs and has usually zoomed off to a safer hiding place by the time you uncover its micro-shelter.

In 1990 I discovered a third Tasmanian henicopid, which like the previous two species is brown, c. 15mm long and very fast. Known only from a single site in northwest Tasmania, this third species fits neatly within the southern hemisphere genus *Paralamyctes*.

Tasmania is also home to the cosmopolitan *Lamyctes* species which in the U.K is called *fulvicornis* and in New Zealand *emarginatus*. Chamberlin (1920) named Tasmanian specimens *tasmanianus*, but parochialism of this kind is patently silly. In Tasmania *Lamyctes* is known only from farms, gardens, quarries, roadsides and marram grass plantings on unstable dunes.

In addition to the above four henicopine henicopids, the Tasmanian lithobiomorph fauna includes at least two species of Anopsobiinae, both undescribed. Having collected and examined Chilean and New Zealand anopsobiines, I have become an enthusiast for the promotion of Anopsobiinae to Anopsobiidae and stand ready to assist anyone brave enough to attempt a revision of this group. The tiny Tasmanian forms are very abundant in leaf litter and bryophytes.

Craterostigmomorpha

To say that *Craterostigmus tasmanianus* Pocock is bizarre is to fairly summarise the growing morphological literature on this species. What I would like to stress here for the benefit of non-Tasmanian readers is that there is nothing obviously weird and wonderful about *Craterostigmus* to be seen in the field. It is a large and locally abundant centipede occurring in forest throughout Tasmania from sea level to at least 1300m. It tolerates considerable habitat disturbance. Despite a published report to the contrary (Manton, 1965), the species is easily maintained in captivity.

Craterostigmus biology would make a lovely topic for a University honours thesis, but to date University of Tasmania zoology students have been less than keen on centipedes. Female *Craterostigmus* can be found brooding their eggs as early as September and their young as late as April. Females mature relatively early (body length 25 mm as compared to 50 mm in older specimens) and a clutch size of 50-60 eggs is not unusual. The anamorphically 12-leg-paired young are abundant in leaf litter throughout the austral winter and early spring.

Scolopendromorpha

The colourful scolopendrine *Cormocephalus westwoodi* (Newport) is familiar to most Tasmanians from its habit of lurking under the bark of eucalypt firewood logs. It is neither aggressive nor particularly venomous, nor is it an impressively large member of its subfamily, specimens rarely exceeding 50 mm in body length. It is nevertheless feared and is generally executed by homeowners for the crime of being a centipede. Fortunately, *C.westwoodi* is abundant in northern and eastern Tasmania. According to Koch (1983), the same species is found in mainland Australia, New Guinea, New Zealand, South Africa, Madagascar and Sri Lanka.

The only other Tasmanian scolopendromorphs are *Cryptops* species. The introduced *C.hortensis* Leach prefers gardens while the native species, all undescribed but closely resembling New Zealand forms, are rarely seen outside native forest. Two of the four known native *Cryptops* are widespread and broadly sympatric, occasionally being found together in the same rotting log. A third species appears to be geographically restricted and is on my 'worry list' for invertebrate conservation.

Geophilomorpha

For years I have carefully avoided thinking too much about the taxonomy of the southern hemisphere Geophilomorpha. Life, after all, is short and there are many more tractable myriapodological problems to brood over. You can imagine my delight when Dick Jones wrote recently to ask for the loan of Tasmanian material. The Queen Victoria Museum quickly forwarded 1000-odd specimens before Dick could reconsider his request.

Broadly speaking, there are two widespread and abundant genera of Tasmanian geophilomorphs which may or may not be congeneric with other southern hemisphere geophilomorphs. The family placement is uncertain. There are also intertidal geophilomorphs which may or may not be introduced. Introduced, anthropophilic geophilomorphs in Tasmania appear to be species of *Schendyla* and *Necrophloeophagus*. For more information, contact Dick Jones in Norfolk!

MILLIPEDES

Polyxenida and Polyzoniida

These two orders are currently under investigation by Dennis Black at La Trobe University in Melbourne. No species have been described.

Polyxenida are uncommon in Tasmania and apparently restricted to the coastal zone and adjacent islands.

Polyzoniida are relatively common in forests and modestly diverse. At least one large species (30mm long) is known to brood its eggs. Another occurs in aggregations on or under eucalypt

bark.

Chordeumatida

Three Tasmanian species have been described by Golovatch (1986). Work in progress by Bill Shear in Virginia suggests that there are more than 10 species in the Tasmanian fauna, representing at least two families. Chordeumatida are widespread and abundant in Tasmanian forests but until recently were very poorly represented in collections, perhaps because of their size (5-12mm).

Sphaerotheriida

Procyliosoma leae and *P. tasmanicum* were described from Tasmania by Silvestri (1917). Both are widespread. A much larger, still undescribed sphaerotheriid occurs in Tasmania's eastern highlands. All forms prefer deep forest litter and the spaces beneath loose-lying stones.

Spirostreptida

Jeekel (1981) suggests that all Tasmanian spirostreptidans are Iulomorphidae. There are four described species (Brölemann, 1913; Chamberlin, 1920; Verhoeff, 1944) but the taxonomy of this group in Tasmania needs re-examining. The spirostreptidans are phenomenally abundant in forest habitats and typically account for one-third or more of handpicked and pitfall millipede specimens. The larger species secrete copious amounts of quinonoid material when disturbed.

Polydesmida

Both in diversity and abundance the Polydesmida dominate the Tasmanian millipede fauna.

Paradoxosomatids are abundant in coastal, near-coastal and dry habitats. Only one species has been described (*Notodesmus scotius* Chamberlin), but C.A.W. Jeekel is currently investigating other forms. Several species are day-active and one northeastern species 'swarms' in dry woodland during the late spring.

For the past two years I have been looking closely at Tasmanian representatives of the Dalodesmidae, a family prominent on the southeast Australian mainland as well as in New Zealand. There are at least 25 species in *Lissodesmus*, of which five are named (Jeekel, 1984), six in *Gasterogramma*, with one named (Jeekel, 1982), three in two genera, and several in genera shared with New Zealand. Three of the dalodesmid genera have strong-smelling defensive secretions which alert the educated nose to the presence of particular species.

There is also a bewildering assortment of 'little litter millipedes' in the Tasmanian Polydesmida of uncertain family placement. Two of these are mentioned by Jeekel (1984).

My most recent work has been a mapping exercise with *Lissodesmus*.

The genus is nearly ubiquitous in Tasmania and constitutes what Shelley (1990) calls an 'allopatric/parapatric mosaic complex of species'. From a conservation point of view, I am concerned by the number of geographically restricted *Lissodesmus* species revealed by my surveys, and I am beginning to wonder whether comparable mapping studies in other millipede genera would generate similar conservation headaches.

Introduced millipedes

Several anthropophilic, introduced species are in Tasmanian collections awaiting firm identification, among them what I presume is *Ommatoiulus moreletii* Lucas.

CONCLUSION

As far as I know, there are only two myriapodological investigations currently active in Australia: Dennis Black and myself. Between us we hope to shed some light on the taxonomy and biology of small portions of the Tasmanian millipede fauna. The 'offshore' myriapodologists mentioned above will also make contributions, but it is likely that most Tasmanian centipede and millipede species will remain unnamed and unstudied for many years to come. Tasmania, however, is unusually well-worked compared to the Australian mainland, whose thousands of species persist (some precariously, in the face of continuing habitat destruction) in a myriapodological near-vacuum. The same is true for many other arthropod groups. In Jeekel's words, 'one may wonder whether Australia, with its large territory and small population, will ever produce the broad scale of specialists needed for simply taking stock of the arthropod fauna of the continent' (Jeekel, 1981; p.2).

REFERENCES

- Anonymous., (1982) Opinion 1228. Henicopidae Pocock, 1901 given nomenclatural precedence over Cermatobiidae Haase, 1885 (Myriapoda, Chilopoda). *Bull.Zool.Nom*, 39:235-237.
- Brolemann, H.W., (1913) The Myriapoda of the Australian Museum. Part II Diplopoda. *Rec.Aust.Mus*, 10:77-158.
- Chamberlin, R.V., (1920) The Myriapoda of the Australian region. *Bull.Mus.Comp.Zool.Harvard*, 64:1-269.
- Golovatch, S.I., (1986) The first Chordeumatida (Diplopoda) from Tasmania, with the description of a new genus and three new species. *Zool.Jahrb.Syst*, 113:251-264.
- Jeekel, C.A.W., (1981) Australia Expedition 1980: legit C.A.W. Jeekel and A.M. Jeekel-Rijvers. List of collecting stations, together with general notes on the distribution of millipedes in eastern Australia and Tasmania. *Versl.techn.Gegev.Inst.taxon.Zool*, 30:1-59.

Jeekel, C.A.W., (1982) Millipedes from Australia, 4: A new genus and species of the family Dalodesmidae from Tasmania (Diplopoda, Polydesmida). *Bull.zool.Mus.Amst*, 9:9-15.

Jeekel, C.A.W., (1984) Millipedes from Australia, 7: The identity of the genus *Lissodesmus* Chamberlin, with the description of four new species from Tasmania (Diplopoda, Polydesmida, Dalodesmidae). *Pap.Proc.Roy.Soc.Tasm*, 118:85-102.

Johns, P.M., (1964) Insects of Campbell Island. Chilopoda, Diplopoda (Preliminary note on the Myriapoda of the New Zealand subantarctic islands). *Pacific Insects Monograph*, 7:170-172.

Kirkpatrick, J.B. & Brown, M.J., (1991). *Reservation Analysis of Tasmanian Forests*. Unpublished report for the Resource Assessment Commission.

Koch, L.E., (1983) Revision of the Australian centipedes of the genus *Cormocephalus* Newport (Chilopoda: Scolopendridae: Scolopendrinae). *Aust.J Zool*, 31:799-833.

Manton, S.M., (1965) The evolution of arthropodan locomotory mechanisms. Part 8. *J.Linn.Soc.(Zool.)*, 45:251-484.

Mesibov, R., (1986) *A Guide to Tasmanian Centipedes*. Hobart: by the author.

Shelley, R.M., (1990) Are allopatric/parapatric mosaic complexes widespread in the Diplopoda? In Minelli, A. (ed.), *Proc.7th Intl. Congr. Myriapodology*. Leiden: E.J.Brill.

Silvestri, F., (1917) Materiali per una revisione dei Diplopoda Oniscomorpha. II.(1). Specie di Sphaeroteridae delle regioni australiana e neozelandese a me note. *Boll.Lab.Zool.gen.agr. Portici*, 12:61-85.

Verhoeff, K.W., (1944) Zur Kenntnis der Cambaliden und über einige neue australischen Formen derselben. *Zool.Anz*, 145:27-45.