

A PRELIMINARY STUDY OF THE RELATIONSHIPS OF TAXA INCLUDED IN THE TRIBE POLTYINI (ARANEAE, ARANEIDAE)

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ABSTRACT. *Polty*s and the genera *Cyphalonotus*, *Homalopolty*s, *Ideocaira*, *Kaira*, *Micropolty*s and *Pycnacantha* have historically been considered members of the tribe Poltyini. There is little published information on most members of the group and their potential relationships in the context of recent advances in araneid systematics. Information is sought on possible relatives of *Polty*s. All araneid members of the group except *Pycnacantha* were added to the data matrix compiled by Scharff & Coddington (1997), which already contained *Kaira*. *Homalopolty*s was found to be a tetragnathid when males were identified and was not considered further. The full data matrix of 74 taxa and 82 characters was run in PAUP* and NONA. The resulting placement of *Polty*s was not well supported but it frequently occurred in association with members of a slightly modified version of the ‘*Hypsosinga* clade’ of Scharff & Coddington, including *Kaira*. *Cyphalonotus* may be placed close to *Araneus* and *Ideocaira* may also belong in the same area of the araneines. *Micropolty*s may belong in the sister clade to these two.

Keywords: *Polty*s, *Cyphalonotus*, *Ideocaira*, *Micropolty*s, phylogenetic relationships.

Spiders of the genus *Polty*s C.L. Koch 1843 are distributed throughout the Old World, mostly in tropical and subtropical regions. The Australasian species mimic galls or dead twigs by day and exhibit morphological modifications to enhance their cryptic disguise, making them rather odd-looking spiders. After some initial uncertainty over the affinities of the genus (Koch thought it might belong with taxa that are now included within Uloboridae) Simon (1895) placed *Polty*s in the subfamily Argiopinae as the nominative member of the tribe Poltyeae (here referred to as the Poltyini to conform with the International Code of Zoological Nomenclature). Also included by Simon were the genera *Cyphalonotus* Simon 1895, *Homalopolty*s Simon 1895, *Kaira* Cambridge 1889 and *Pycnacantha* Blackwall 1865. The genera *Ideocaira* Simon 1903 and *Micropolty*s Kulczyński 1911 were described later, and their authors suggested that they might be related to *Kaira* and *Polty*s, respectively. More recently they were listed as part of the Poltyini (as ‘Poltyeae’) by Dippenaar-Schoeman & Leroy (1996). Archer (1951) recognized that the male pedipalp of *Cyphalonotus* was far more complex than that of *Pol-*

tys and proposed a new tribe, the *Cyphalonotini*, for the former, later he decided it belonged in the ‘*Dolophini*’ (Archer 1965). None of these tribes are currently in regular taxonomic use, and I am using the Poltyini grouping in the broadest sense, including all the above genera as the basis for this study.

The phylogenetic analysis of araneid taxa by Scharff & Coddington (1997) was based on taxa selected from Simon’s tribes (or the earlier subfamily versions thereof), and *Kaira* was used as the representative of the Poltyini. The results suggested that *Kaira* should be placed in the ‘*Hypsosinga* clade’ in the mid-basal araneines. If Simon was correct in his affiliations of taxa this is where *Polty*s, and the remaining Poltyini taxa, should also belong. However, Scharff & Coddington (1997) also found that some of Simon’s taxa were seriously polyphyletic. As Archer may have realized during his work on *Cyphalonotus*, the possibility of errors in Simon’s grouping of the Poltyini was compounded by his lack of knowledge of the males of almost all the genera in the tribe. Simon’s assemblage was apparently based on the irregular form of the abdomen, slightly unusual eye arrangements

and the strong macrosetae on the legs of the three genera which are now known to prey mainly on moths (*Kaira*, *Polty*s and *Pycnacantha*) (Stowe 1986; Dippenaar-Schoeman & Leroy 1996). There is a confusing mixture of similarities and contradictions amongst characters within the genera of this putative group and also with respect to genera elsewhere in the Araneidae. These conflicts make the assessment of the likely placement of *Polty*s within the Araneidae problematic.

The primary motivation for this work was to attempt to establish some possible relatives of *Polty*s which could provide a sensible out-group taxon for an analysis of the Australasian *Polty*s taxa. Most of the other putative Poltyini would not be suitable for this, even if they were closely related, because of the problems of obtaining suitable recent material for destructive techniques such as the extraction of DNA. Nevertheless, I was still intrigued by some of the characters exhibited by these taxa and their superficial similarities to *Polty*s. Therefore, there were two goals to this study. The first aim was to test whether *Polty*s might indeed belong in the '*Hypsosinga* clade' of Scharff & Coddington 1997 (and if not, where). Secondly, to find out whether, without any changes or additions to the characters used, the Poltyini would emerge as a monophyletic grouping within the context of the taxa examined by Scharff & Coddington 1997.

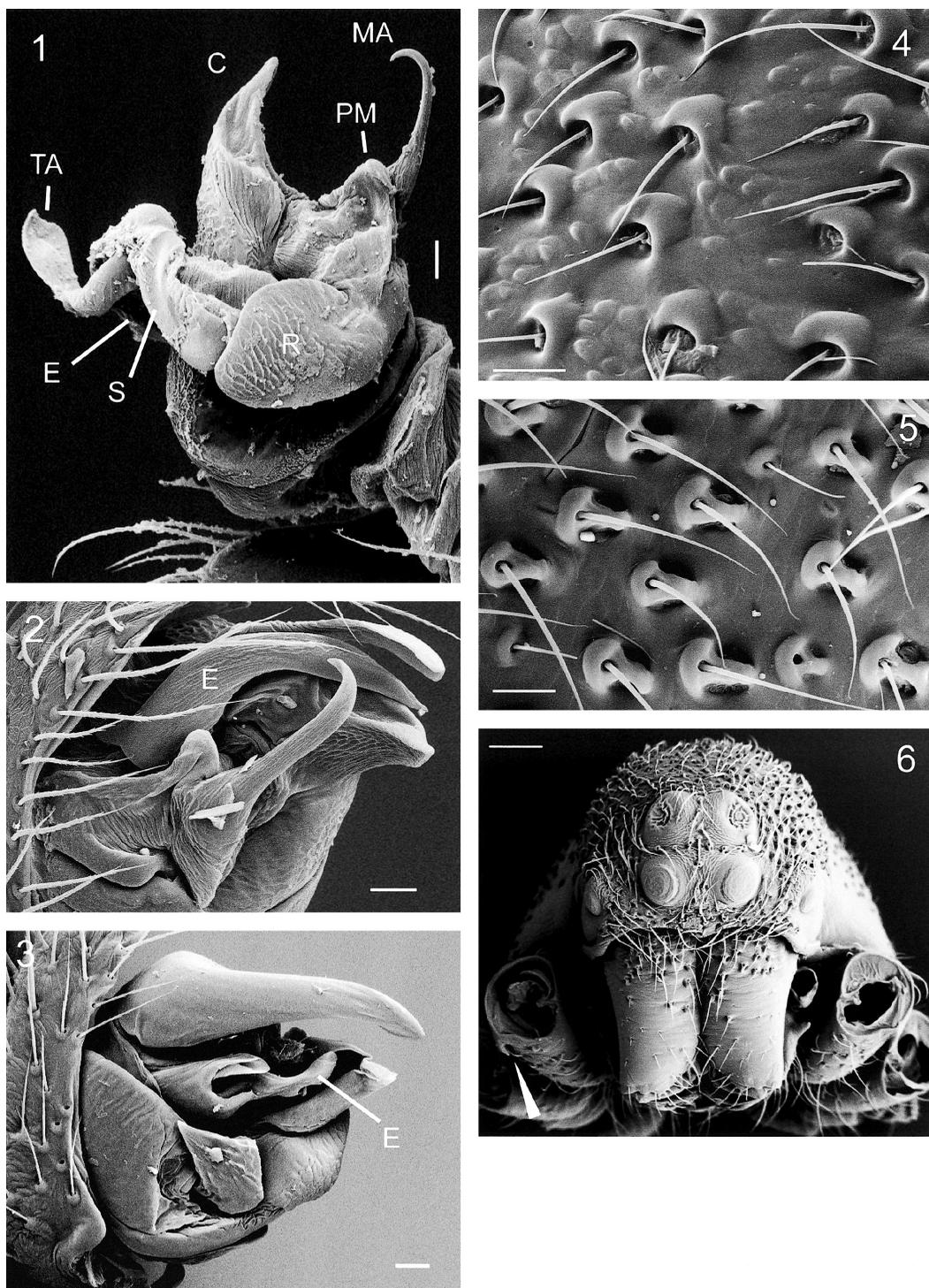
METHODS

Taxa.—The genus *Pycnacantha* was excluded, as no male specimens were available. *Kaira* was recently revised by Levi (1993) and was included by Scharff & Coddington 1997 in their study. The other genera of Poltyini are generally poorly known and it was first necessary to identify males for *Homalopolty*s, *Ideocaira* and *Micropolty*s, which are described only from females. When *Homalopolty*s males were found it became apparent that this taxon is in fact a tetragnathid. This genus was therefore excluded from further analysis here. The female type of *Ideocaira transversa* Simon 1903 has been examined, and unpublished drawings of the female type of *Micropolty*s *placenta* Kulczyński 1911 were supplied by H. Levi. Unfortunately, none of the species in which males could be matched to females represented the type species of the ge-

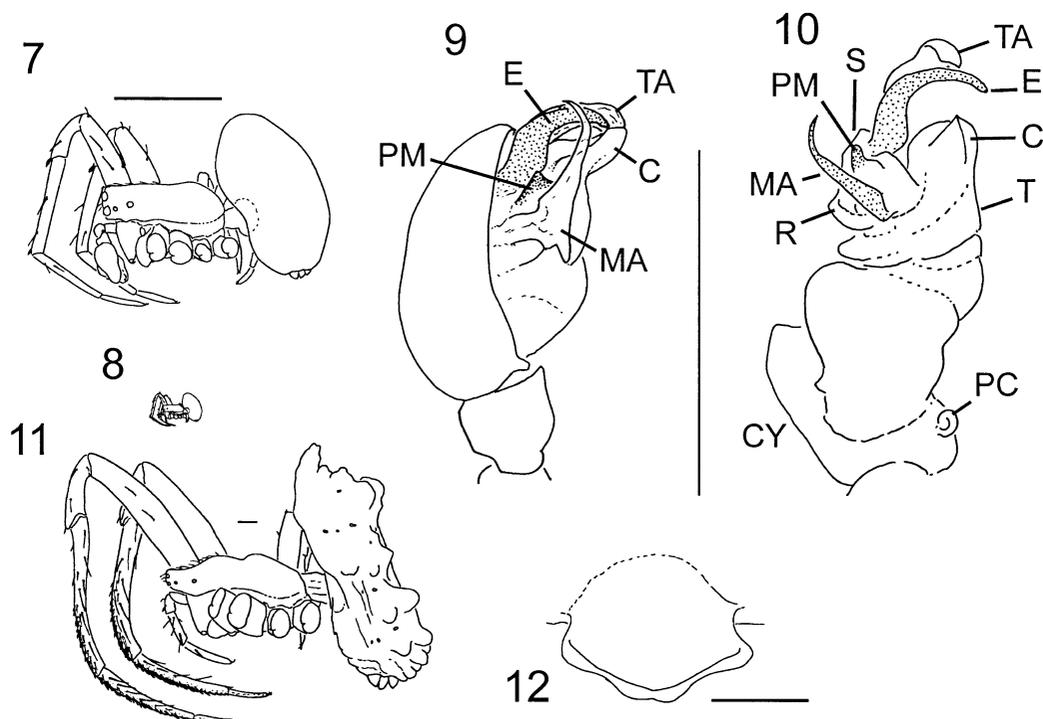
nus. For *Cyphalonotus*, the expanded pedipalp is from a different species to that used for scoring general characters (necessitated by the need to use material from the only vial which contained more than a single male). The structures visible on the unexpanded pedipalp of the species against which other male and female characters were scored appear to be similar; there are also no scoreable differences in the general attributes in the males of both species. Neither species has been identified, the type species, *C. larvatus* (Simon 1881), is recorded from Congo and East Africa (Platnick 2005). This leaves *Polty*s *illepidus* C.L. Koch 1843 as the only type species used in this analysis. Although this is far from ideal, the nature of this data set, with a rather high proportion of taxa to characters, meant robust results were unlikely even before adding additional taxa (Scharff & Coddington 1997). Therefore, I did not expect to achieve precise results in this tentative exploration of these genera and any more rigorous analysis would need to address these issues.

Abbreviations.—The following abbreviations for morphological features were used throughout the text and figures: C = conductor; CY = cymbium; E = embolus; MA = median apophysis; PC = paracymbium; PM = paramedian apophysis; R = radix; S = stipes; SEM = scanning electron microscope; T = tegulum; TA = terminal apophysis; TL = tegular lobe. The following abbreviations were used for repository institutions: AM = Australian Museum, Sydney, Australia; MNHNP = Muséum National d'Histoire Naturelle, Paris, France; MRAC = Koninklijk Museum voor Midden Afrika, Tervuren, Belgium; NCAP = National Collection of Arachnida, Pretoria, South Africa; NHRM = Swedish Museum of Natural History, Stockholm, Sweden; QM = Queensland Museum, Brisbane, Australia; RMNH = National Museum of Natural History, Leiden, The Netherlands; UNAM = Instituto de Biología, Universidad Nacional Autónoma de México, Mexico D.F., Mexico; ZMB = Museum für Naturkunde, Zentralinstitut der Humboldt-Universität, Berlin, Germany.

Characters.—The character attributes for each of the selected taxa were examined and scored according to the methods of Scharff & Coddington 1997. The specimens examined are shown in Table 1 and attribute codings are



Figures 1–6.—Scanning electron micrographs of *Poltys* and *Micropoltys*: 1. *Poltys illepidus* from Trinity Park, male; expanded pedipalp, apico-dorsal view; 2. *Poltys illepidus* from Lakeland, male, pedipalp, prolateral. 3–6. *Micropoltys* sp. from W of Cape Kimberley, male: 3. Pedipalp, prolateral; 4, 5. Modified setal bases and sensory seta on carapace and sternum, respectively; 6. Prosoma, frontal view. See text for abbreviations. Scale bars Figs. 1, 2 (30 μm), Figs. 3–5 (20 μm), Fig. 6 (100 μm).



Figures 7–12.—*Poltys illepidus*: 7–9. Male from Trinity Park: 7. General lateral view; 8. Ditto but at same scale as female; 9. Left pedipalp, prolateral. 10. Male from Rockhampton, left pedipalp, expanded, prolateral. 11. Female from Trinity Park: General lateral view. 12. Female from Brisbane, epigynum, ventral. See text for abbreviations. Scale bars Figs. 7, 11 (1 mm), Figs. 9–10, 12 (0.5 mm).

shown in Table 2. The full list of characters is not repeated here but most characters are adequately illustrated in Figs. 1–30. Some characters, listed below, do require some comment on their interpretation in relation to the Scharff & Coddington 1997 analysis.

Character 11 and 12: Median apophysis of male pedipalp with bifid prong or threadlike spur. The apically directed hook-like portion of the *Poltys* MA is very distinctive (Figs. 1, 9). However, it does not conform totally to either of the diagnoses for these character states.

Character 19: Stipes absent or present. In *Micropoltys* the sperm duct appears to pass from the radix, through the base of the distal haematodocha and straight into the embolus. There is apparently no sclerite as such between the two, so this is scored absent [0] (Fig. 28).

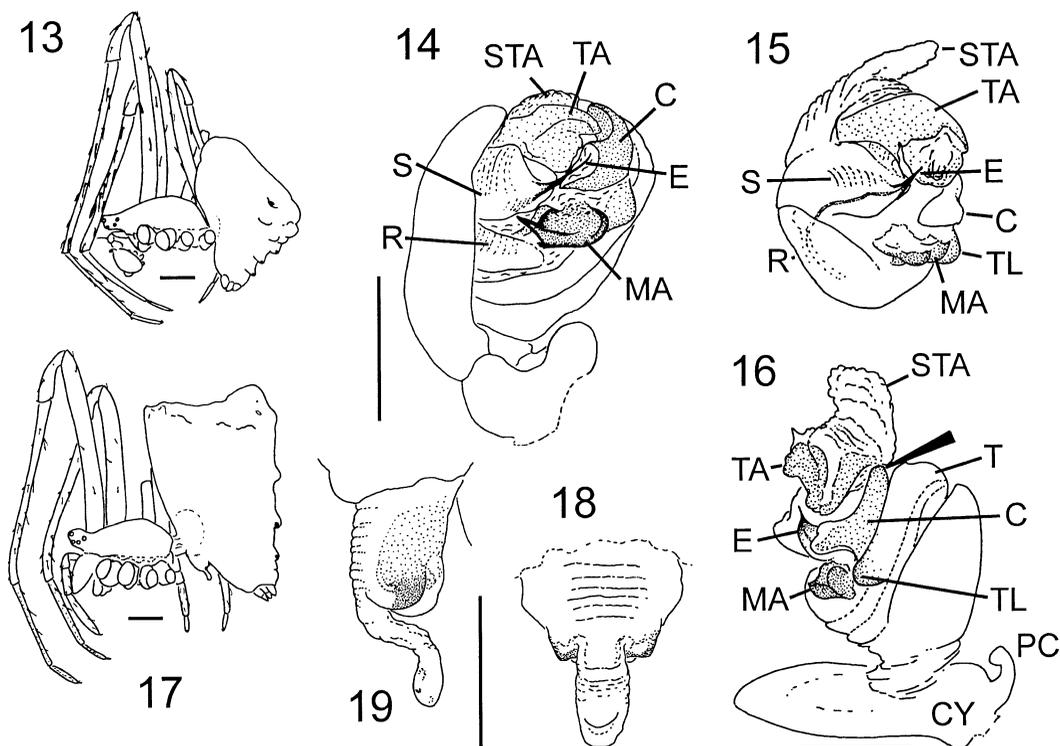
Character 23: Tip of male pedipalp embolus simple or with cap. Only *Poltys* and *Micropoltys* pedipalps have been examined under SEM (Figs. 2, 3). There is no indication on

either of these that any part is designed to break off, or has already done so. These are scored as simple [0]. The attributes of the other genera are unknown so they are scored [?].

Character 30: Scape with pocket near tip, absent or present. *Poltys illepidus* have a broad turned-over rim along the whole of the posterior margin of the epigyne (Fig. 12). I have interpreted this as a (rather wide) pocket present [1]. *Micropoltys* females have at least a sharp depression which is tentatively also scored here as a pocket present [1] (Fig. 30).

Character 33 and 34: Coxa I hook and femur II groove. Among these taxa, all of the males with similarly sized females have these features (e.g. coxal hook arrowed in Fig. 6, *Micropoltys*).

Character 46: Clypeal tooth of females absent or present. Both males and females of the *Micropoltys* species figured have a rather rounded clypeal tooth. The male is shown in Fig. 6, but the tooth is more developed in females. This character is not present in Levi's



Figures 13–19.—*Cyphalonotus* sp.: 13, 14. Male from Natal: 13. General lateral view; 14. Left pedipalp, prolateral; 15, 16. Male from Misahöhe: Left pedipalp expanded, prolateral and retrolateral (different species to Fig. 14). 17–19. *Cyphalonotus* sp. from Natal, female: 17. General lateral view; 18, 19. Epigynum, ventral and lateral. See text for abbreviations. Scale bars Figs. 13, 17 (1 mm), Figs. 14–16, 18, 19 (0.5 mm).

drawing of the type female of *Micropoltys placenta* but I have scored it as present [1].

Character 50: Ratio of lateral eye–median eye separation, < 1 or > 1 . *Poltys* and *Micropoltys* are unusual among araneids in that they have widely separated lateral eyes, so there is no lateral eye group as such (Figs. 7, 11, 26, 29). In applying this character to these genera I took the Scharff & Coddington 1997 instructions literally, and used the distance at the widest point, i.e. that to the posterior eye, so that the separation is scored as > 1 [1].

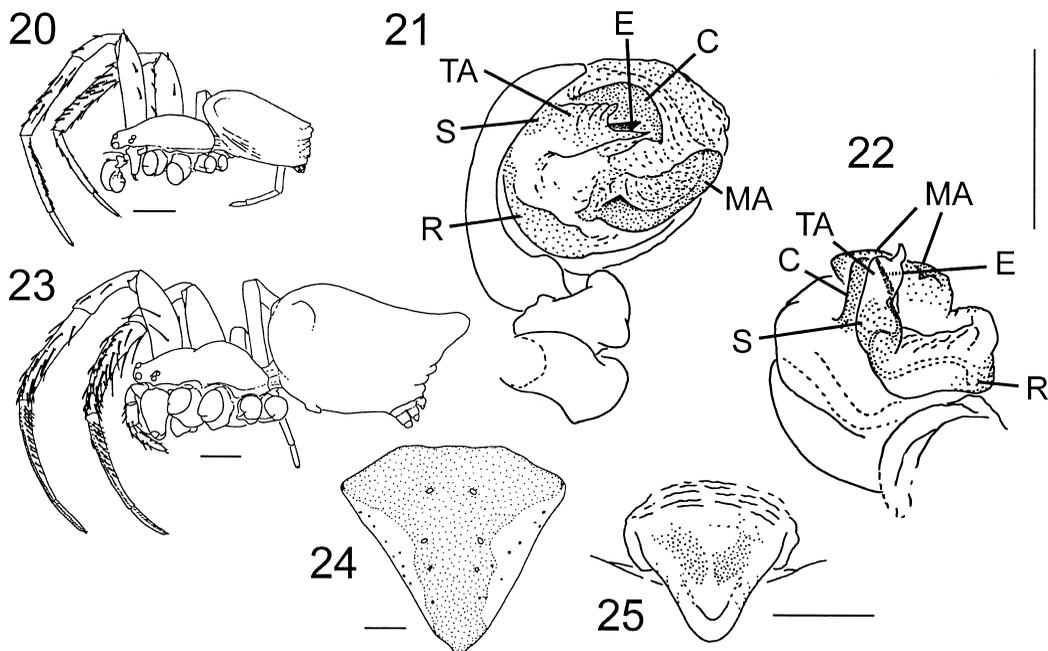
Characters 59 and 60: Abdominal shape. Both male and female *Ideocaira triquetra* Simon 1903 have strongly triangular abdomens, which are widest anteriorly (Fig. 24, female). The females of *I. triquetra* vary in their relative dimensions, some being wider than long and some the reverse. However, the female of *I. transversa*, the type species, is distinctly wider, so I have used this to decide the matter and scored Character 60 as wider [1].

Character 67: Tactile setal bases on carapace and abdomen, normal or gasteracanthine-shaped. *Micropoltys* has rather distinctive setal bases over much of the prosoma, including the basal chelicerae (Fig. 6). There are none on the dorsum of the abdomen, but they do occur around the pedicel on the venter. Some of these bases and the setae themselves (Fig. 4) are extremely similar to those figured by Scharff & Coddington 1997 and I have scored them as gasteracanthine-like [1]. Those on the sternum (Fig. 5) and around the eye region and chelicerae are further modified, with an antierad-projecting lamella and deep pits on each side.

Characters 74 and 75: Orb web and sticky spiral. Joseph Koh has provided me with a photograph of *Cyphalonotus* in an orb web. I cannot see anything to suggest that it is not a normal araneid web and so have scored Character 75, sticky spiral, as present [0]. (This

Table 1.—Details of specimens examined in this study.

| Sex & Species | Locality data | Coordinates | Repository & No. | Used for |
|--------------------------------|--|-------------------|------------------------------|--|
| ♂ ♀ <i>Cyphalonotus</i> sp. | Natal, South Africa | | MNHNP 19654 | All codings; Figs. 13, 14, 17–19 |
| ♂ <i>Cyphalonotus</i> sp. | Misahöhe, Togo | 06°57'N, 00°35'E | ZMB (unreg'd) | Expanded pedipalp; Figs. 15, 16 |
| ♂ ♀ <i>Ideocaira triquetra</i> | Mzimhlava river mouth, Lusikisiki district, Eastern Cape, South Africa | 31°22'S, 29°35'E | MRAC 166621 | All codings; Figs. 20–25 |
| ♀ <i>Ideocaira triquetra</i> | Port Elizabeth, Eastern Cape, South Africa | 33°58'S, 25°35'E | MNHNP 18508 | Types (2), used to confirm ID |
| ♀ <i>Ideocaira transversa</i> | Natal, South Africa | | MNHNP 16334 | Type |
| ♂ <i>Micropoltys</i> sp. | Cape Kimberley, Queensland, Australia | 16°16'S, 145°28'E | AM KS86251 | Pedipalp; Fig. 27 |
| ♂ <i>Micropoltys</i> sp. | Cape Kimberley, Queensland, Australia | 16°16'S, 145°28'E | AM KS86252 | Expanded pedipalp, general codings; Figs. 26, 28 |
| ♂ <i>Micropoltys</i> sp. | W of Cape Kimberley, Queensland, Australia | 16°15'S, 145°26'E | AM KS86740 | SEM; Figs. 3–6 |
| ♀ <i>Micropoltys</i> sp. | Cooktown, Queensland, Australia | 15°29'S, 145°15'E | AM KS57876 | General codings; Fig. 29 |
| ♀ <i>Micropoltys</i> sp. | W of Cape Kimberley, Queensland, Australia | 16°15'S, 145°26'E | AM KS57890 | Epigynum; Fig. 30 |
| ♂ <i>Poltys illepidus</i> | Trinity Park, N Cairns, Queensland, Australia | 16°48'S, 145°42'E | AM KS86253 | General codings; Figs. 7–9 |
| ♂ <i>Poltys illepidus</i> | Rockhampton, Queensland, Australia | 23°22'S, 150°29'E | AM KS58033 | Expanded pedipalp; Fig. 10 |
| ♂ <i>Poltys illepidus</i> | Trinity Park, N Cairns, Queensland, Australia | 16°48'S, 145°42'E | AM ex eggsac laid by KS86257 | SEM; Fig. 1 |
| ♂ <i>Poltys illepidus</i> | Lakeland, SW of Cooktown, Queensland, Australia | 15°50'S, 144°53'E | AM KS58017 | SEM; Fig. 2 |
| ♀ <i>Poltys illepidus</i> | Trinity Park, N Cairns, Queensland, Australia | 16°48'S, 145°42'E | AM KS86258 | General codings; Fig. 11 |
| ♀ <i>Poltys illepidus</i> | Brisbane, Queensland, Australia | 27°30'S, 152°58'E | QM S20786 | Epigynum; Fig. 12 |
| ♀ <i>Poltys illepidus</i> | Edmonton, Queensland, Australia | 17°01'S, 145°44'E | AM KS86310 | SEM (spinnerets, not figured) |



Figures 20–25.—*Ideocaira triqueta* from Lusikisiki district: 20–22. Male: 20. General lateral view; 21, 22. Left pedipalp, prolateral and expanded, dorsal view. 23–25. Female: 23. General lateral view; 24. Abdomen, dorsal; 25. Epigynum, ventral. See text for abbreviations. Scale bars Figs. 20, 23, 24 (1 mm), Figs. 21, 22 (0.5 mm), Fig. 25 (0.25 mm).

character makes no difference to the position of *Cyphalonotus* in the results).

Character 78: Sticky-spiral (SS) localization: outer leg 1, inner leg 1 or leg 4. In the *Poltys* species I have observed spinning webs, leg 4 is mostly used to monitor the position of the spider with respect to the sticky spiral, especially closer to the hub where the distance between radii is very short (Smith unpub. data). I do not have notes on the behavior of *P. illepidus* itself, but the web is similar to the species I observed and I have therefore scored it as L4 [2]. These *Poltys* species also move around the web in a similar way to the larger

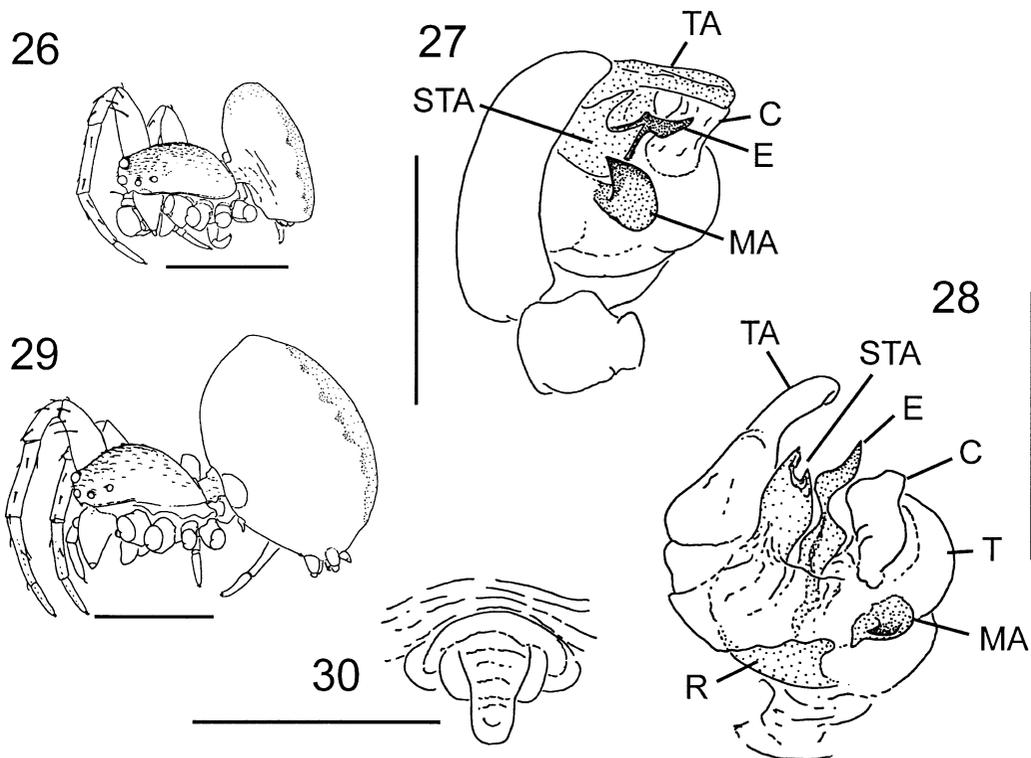
nephilines (Scharff & Coddington 1997; Eberhard 1982), constantly facing between the hub and the direction of travel. Like these nephiline spiders, *Poltys* makes a finely meshed web, which probably influences the most efficient way of moving around the web (Eberhard 1982).

Analysis.—The full set of data (74 taxa, 82 characters) was run in PAUP* (Swofford 2001) using a heuristic search with the commands:

hsearch addseq=random nchuck=5 chuckscore=1 nreps=1000 randomize=trees;

Table 2.—Character attribute codings for the newly added Poltyini taxa. See Scharff & Coddington (1997) for full list of characters.

| | Character number | | | | | | | |
|---------------------|------------------|------------|------------|------------|------------|------------|------------|------------|
| | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 |
| | 1234567890 | 1234567890 | 1234567890 | 1234567890 | 1234567890 | 1234567890 | 1234567890 | 1234567890 |
| <i>Cyphalonotus</i> | 1111110100 | 0000011011 | 01?0000101 | 1011000011 | | | | |
| <i>Ideocaira</i> | 0111110000 | 0000011010 | -1?0000101 | 0011000011 | | | | |
| <i>Micropoltys</i> | 0021110000 | 0000011001 | 0100000101 | 0011000011 | | | | |
| <i>Poltys</i> | 0000110000 | 0000011110 | -100000101 | 0000000011 | | | | |



Figures 26–30.—*Micropoltys* sp.: 26–28. Male from Cape Kimberley: 26. General lateral view; 27, 28. Left pedipalp, prolateral and expanded, apico-dorsal view. 29. Female from Cooktown, General lateral view; 30. Female from W of Cape Kimberley, Epigynum, ventral. See text for abbreviations. Scale bars Figs. 26, 29 (1 mm), Figs. 27, 28, 30 (0.25 mm).

hsearch start=current nchuck=0 chuck-score=0;

The first line keeps only 5 trees from each island sampled, preventing the tree buffers from filling with thousands of trees and increasing the chances of finding all islands of trees. One thousand replicates are carried out, each time with the taxa added in a random order. The default branch swapping algorithm TBR (tree bisection reconnection) is used. The

order of the resulting trees is randomized before entering the second line of command. The second line swaps on the trees kept from the first search to completion.

All data was also run in NONA (Goloboff 1993) using the standard commands, as recommended by Miller (2000):

mult*1000;
max*; or jump*1;

Before using any consensus method in

Table 2.—Extended.

| Character number | | | | | | | | | |
|------------------|------------|------------|-------------|------------|------------|------------|------------|----|--|
| 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | |
| 1234567890 | 1234567890 | 1234567890 | 1234567890 | 1234567890 | 1234567890 | 1234567890 | 1234567890 | 12 | |
| 0000100010 | 110000-000 | 0001000100 | 2??11????? | ?? | | | | | |
| 0000100011 | 110000-061 | 0001000100 | 21????????? | ?? | | | | | |
| 0000110001 | 110000-000 | 00000011?? | ??????????? | ?? | | | | | |
| 0000000011 | 110000-000 | 1001000100 | 2101000200 | 00 | | | | | |

PAUP* it is desirable to check through the topologies and delete any with zero-length branches (Scharff & Coddington 1997). NONA's algorithms are better in this regard but the program can still produce uncollapsed polytomies which are suboptimal once collapsed. Scharff & Coddington 1997 also advocate the filtering of tree sets to remove those trees containing polytomies for which there is a more resolved solution present. With the solution present in another, otherwise identical tree, it is reasonable to support their interpretation as 'soft' polytomies, i.e. irresolution due to a lack of data, rather than 'hard' polytomies which is an assertion of simultaneous cladogenesis (Coddington & Scharff 1996). The tree data set can be filtered in PAUP* but the removal of trees containing zero-length branches is more problematic. Two methods used here are the manual removal of the topologies with assigned zero-length branches from a saved PAUP* tree file, or alternatively using WinClada (Nixon 1999–2002) by a process of collapsing unsupported nodes then removing suboptimal trees. The tree set produced by NONA can also be 'cleaned up' using WinClada, but cannot easily be filtered. While tree data sets from either PAUP* or NONA can be imported into WinClada and back into NONA, once exported from PAUP* retrieving them is difficult. An Adams consensus (Adams 1972; implemented in PAUP*) was required to examine whether clades might be recovered which would otherwise not be found by more simple consensus methods. Consequently, the tree set primarily used is that produced by PAUP*'s filtering and the manual removal of topologies with zero-length branches. However, this is not the same as the set obtained by passing the filtered trees through the WinClada routine. It was decided that both methodologies should be used to confirm that any conclusions drawn were supported in both cases. Strict, majority-rule and Adams consensus trees were produced in PAUP* and all topologies were examined using WinClada.

RESULTS

PAUP* initially found 948 minimal length trees (300 steps). This was reduced to 376 trees by filtering and finally 156 trees after manual removal of topologies with zero length internal branches (referred to subse-

quently as the 'manual tree set'). After passing the filtered set through WinClada, 132 topologies remained (the 'WinClada tree set'). NONA found 344 initial trees using the jump*1 command (length 300, as PAUP*), which is reduced to 232 trees after collapsing polytomies in WinClada. These topologies are the same as those in the PAUP* data set (shown by putting the unfiltered PAUP* tree set through WinClada: the same 232 trees are found). Using the max* swapping algorithm was less effective and only recovered 308 trees, or 192 trees post WinClada.

All the consensus trees maintain the outgroup structure and basal araneid placement of *Chorizopes* O.P.-Cambridge 1870 found by Scharff & Coddington 1997 (fig. 82, Fig. 31). The araneines become a bush beyond this point in the strict consensus tree (Fig. 31), although with a few resolved terminal clades. All the Poltyini examined here are found within the Araneinae (*sensu* Scharff & Coddington 1997 except for *Scoloderus* Simon 1887). The majority-rule tree produced from the WinClada tree set is slightly less resolved than that shown from the manual tree set (Fig. 32): two additional levels are collapsed in the araneines, so that *Hypsosinga* Ausserer 1871 and *Dolophones* Walckenaer 1837 are in the main araneine 'bush'.

The position of *Poltys* within the araneines is unresolved by all the consensus methods (Figs. 31–33). The character partition table from PAUP* indicates that *Poltys* pairs with *Zygiella* F.O.P.-Cambridge 1902 (31% of trees) or *Kaira* (15%) in the manual tree set, and there are several combinations of a clade involving *Poltys* and some or all of *Zygiella*, *Kaira*, *Metepeira* F.O.P.-Cambridge 1903, *Singa* C.L. Koch 1836, and *Larinia* Simon 1874. Examining trees, these sub-arrangements add up to 61% of topologies. This group is all of the Scharff & Coddington 1997 'Hypsosinga clade' (clade 44), except *Hypsosinga* itself and with the addition of *Larinia*, which also frequently came into this clade in the Scharff & Coddington 1997 analysis. In other topologies there is usually a series of single taxon 'steps' in the basal araneines, in which *Poltys* occurs, often with other parts of the 'Hypsosinga clade' emerging as adjacent steps. In many trees with this type of topology, *Witica* O.P.-Cambridge 1895 and *Arachnura* Vinson 1863 are also present in the very base of the

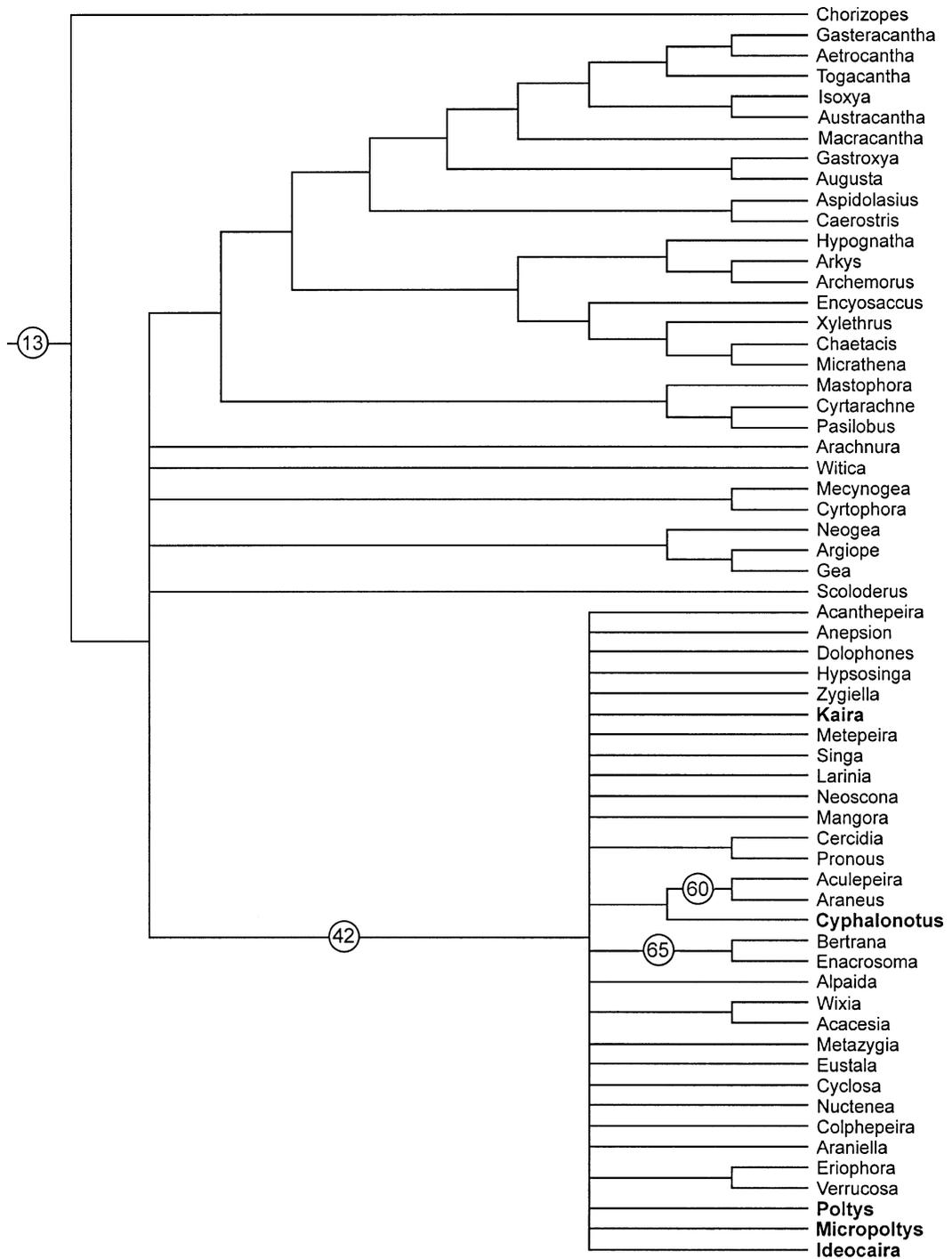


Figure 31.—Strict consensus of the Araneidae for the data of Scharff & Coddington 1997 and taxa from the Poltyini (in bold). Clade numbers show relevant areas of agreement with Scharff & Coddington 1997 (fig. 82).

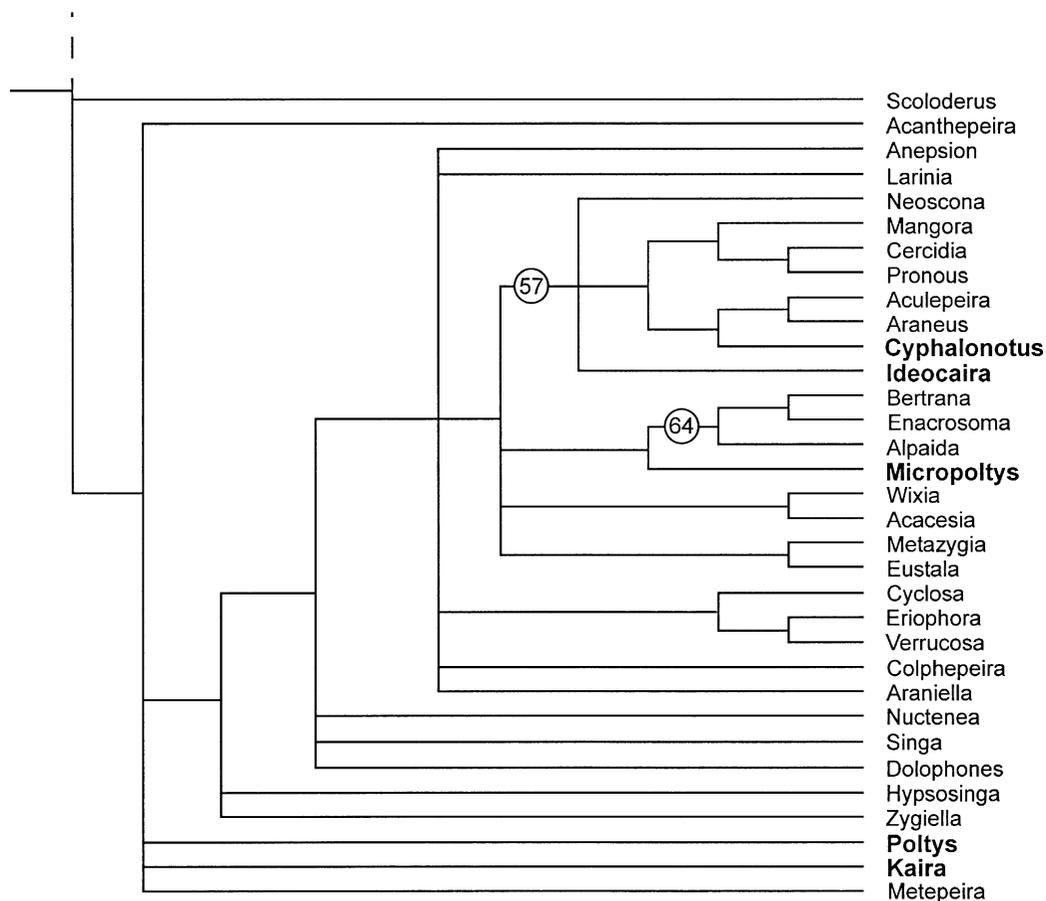


Figure 33.—Adams consensus of the Araneinae for the data of Scharff & Coddington (1997) and taxa from the Poltyini (in bold). Clade numbers show relevant clades analogous to those found by Scharff & Coddington 1997.

serve to suggest the taxa among which these new additions might be placed.

The question of whether *Poltys* should be included in the ‘*Hypsosinga* clade’ remains uncertain. In these results it is most frequently associated with one or more of the genera *Zygiella*, *Kaira*, *Metepeira*, *Singa* and *Larinia*, most of which are indeed from this clade. However, the inclusion of *P. illepidus* in the data set destabilises the arrangement found by Scharff & Coddington 1997 and reduces the former clade to a loose association of genera with variable placement within the Araneinae. Despite this, one of these genera would provide the best choice of outgroup given the current evidence. However, a cautionary comment about other *Poltys* taxa is required. One of the criteria Scharff & Coddington 1997 used when selecting taxa to include in their

analysis, was that the species which were scored should be typical for the genus, or at least an accepted part of the genus. Throughout the genus *Poltys* there is considerable variation in eye arrangements, in presence or absence of a scape on the female epigynum and in some endemic Australian species, presence or absence of a terminal apophysis in the male pedipalp (Smith unpub. data). These are all used as generic characters in this data matrix, yet vary within this genus. Consequently, it is possible that the genera which appear as potential relatives in the scenario above might be different if one of the more aberrant *Poltys* species were used instead. Here, *P. illepidus*, in addition to being the type species, was judged to be the most useful exemplar as it seems to exemplify the ‘basic’ *Poltys* body plan, and lacks some of the apparently more

derived characters seen elsewhere in the genus.

The second aim of this study was to test whether the taxa formerly included in the Poltyni would appear as a group when included with the taxa analysed by Scharff & Coddington. Even ignoring *Homalopollys*, which appears to be a tetragnathid (Smith unpub. data), it is extremely unlikely that the remaining taxa form a monophyletic grouping, although they may all occur scattered among a broader group of araneines. *Cyphalonotus* is the most consistently placed of these taxa, close to *Araneus*, and *Ideocaira* may also belong in the same area of the araneines (Scharff & Coddington 1997 clade 57). *Micropollys* may belong in the sister clade to these two (which would be clade 62 in Scharff & Coddington 1997, fig. 82), and, as already discussed, *Poltys* may belong in or near the 'Hypsosinga clade'. However, given the limitations of this study noted above, these preliminary findings should be subjected to further analysis when the opportunity becomes available.

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