NEW SPECIES OF DIPLOSPHYRONID PSEUDO-SCORPIONS FROM AUSTRALIA

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Through the kindness of Professor Nathan Banks, the writer has been able to study the collections of Australian and New Zealand pseudoscorpions deposited in the Museum of Comparative Zoölogy. The majority of these collections were taken by members of the Harvard Australian Expedition in 1931 and 1932.

The present paper is concerned only with the diplosphyronid pseudoscorpions. The specimens have been mounted on microscope slides after being cleared in beechwood creosote. Measurements were made with a calibrated micrometer ocular and are expressed in millimeters. All of the specimens described here have been returned to the Museum of Comparative Zoölogy.

Family OLPIDÆ Chamberlin 1930
Subfamily OLPINÆ Banks 1895
Genus Olpium L. Koch 1873
Olpium zealandiensis sp. nov.

Figures 1–3

Female. Body moderately slender; carapace moderately brown, abdomen and legs light yellowish brown, palpi deep reddish brown. Length of body 2.7 mm. Carapace smooth except weakly developed netlike lines on the posterior one-third of the face and along the sides. Setæ sparse, only two setæ along the posterior margin of the carapace. The two eyes of each side separated by less than the diameter of the posterior eye. Lateral margins of the carapace weakly convex, posterior margin nearly straight. Length of carapace about 0.8 mm., greatest width across posterior margin and equal to 0.71 mm., ocular width about 0.5 mm.

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Abdomen elongate with sides weakly and evenly convex, length 1.9 mm., width 1.05 mm. All tergites equally sclerotic, not divided, surface marked by very faint net-like sculpturing. Each of the first two tergites with four setae, more posterior tergites with six setae, the tenth and the eleventh with 10 setae. Sternites a little more lightly pigmented than the tergites and virtually unsculptured. Most sternites with six to 10 very fine acuminate setae; sternites not divided.

Chelicera fairly stout, 0.27 mm. long, width of base 0.16 mm. Flagellum of three setae, anterior one stout and denticate along the distal one-third; the middle seta about two-thirds the length of the distal one and also subterminally denticate; the proximal seta inconspicuous, less than one-half the length of the middle one, and apparently acuminate. Fixed finger gently curved, with four or five small, retroconical teeth along the distal one-half of the inner margin; lamina exterior wide and conspicuous; distal tooth of serrula interior ligulate and with finely serrate margin, next three more proximal teeth platyform and with serrate margins, other teeth modified to form a velum. Movable cheliceral finger a little curved, fairly slender; serrula exterior of 20 ligulate plates; subapical lobe stout and with two rounded cusps; apical tooth no more sclerotic than the rest of the finger; galeal seta inserted near the base of the subapical lobe and not reaching to the tip of the galea; galea (Fig. 1) stout, straight, and with three fairly stout and little curved terminal and subterminal rami; length of movable finger 0.2 mm.

Palps (Fig. 2) moderately stout; polished reddish brown in color; investing setae long, acuminate, and fairly numerous; surface smooth except for weakly developed granules on the sides of the maxillae, on the trochanteral protuberances, on the central portion of the flexor surface of the femur, and along the distal half of the flexor surface of the chelal hand. Maxilla 0.44 mm. long, 0.28 mm. wide; trochanter 0.40 mm. long, 0.24 mm. wide; femur 0.71 mm. long, width 0.26 mm.; tibia 0.71 mm. long, 0.31 mm. wide; chela without pedicle 1.16 mm. long, 0.44 mm. wide; chelal
hand without pedicle 0.60 mm. long, 0.42 mm. deep. From the side, chelal hand (Fig. 3) stout, depth little less than the width; hand not much narrowed towards the fingers; length of movable finger 0.62 mm. Many marginal teeth of chelal fingers broken but apparently about 45 conical and cuspid teeth distributed along nearly the entire margin of each finger.

*Legs* moderately stout, yellow in color; setæ fine and acuminate, sparse on the proximal podomeres but longer and more numerous on the distal podomeres; surfaces of pedal podomeres apparently unsculptured; tarsal claws stout. *First leg* with pars basalis deepest across the distal end, length measured along the extensor margin 0.264 mm., depth 0.13 mm.; pars tibialis stout, extensor margin flatly convex, flexor margin more convex, length measured along the extensor margin 0.22 mm., depth 0.143 mm.; tibia subcylindrical except in the proximal portion, length 0.30 mm., depth 0.103 mm.; metatarsus subcylindrical, length 0.135 mm., depth 0.07 mm.; telotarsus a little deeper proximally than distally, length 0.133 mm., depth 0.067 mm. *Fourth leg* with extensor margin of femur a little flatly convex in the center, more convex near the ends; flexor margin of femur more weakly and evenly convex than the extensor margin; length of pars basalis 0.23 mm.; length of pars tibialis measured along the extensor margin 0.55 mm., depth 0.265 mm.; length of entire femur 0.67 mm.; tibia with extensor margin nearly straight except at the proximal end, flexor margin weakly convex, length 0.50 mm., depth 0.14 mm.; metatarsus subcylindrical, with a long tactile seta inserted very close to the proximal margin, length 0.20 mm., depth 0.095 mm.; telotarsus subcylindrical, length 0.17 mm., depth 0.078 mm.

*Genital complex* very simple; posterior operculum or third sternite with four setæ. One median and two lateral cribiform plates, all small and subequal in size.

Type locality. The female holotype collected by Mr. G. Archey on Tera Kihi Island, Hauraki Gulf, New Zealand, on October 25, 1924.

Remarks. A single species of *Olpium, O. michaelsoni* Tullgren, 1909, has been reported previously from the
Australian region. From the description given by Chamberlin (1930), it is evident that *zealandiensis* differs from *michaelsoni* by having much stouter palpal podomeres. By comparing the palp of *zealandiensis* with the figure given by Beier (1932, fig. 210) for the palp of *michaelsoni*, it may be seen that a number of slight differences exist between the two forms with respect to the shape of the palpal podomeres. *Olpium zealandiensis* may be readily separated from other species of the genus by characteristics of the palpal podomeres.

**Genus Xenolpium** Chamberlin 1930

**Xenolpium granulosum** sp. nov.

Figures 4–6

Female. Body elongate; length 4.65 mm. **Carapace** light brown in color; posterior margin nearly straight, anterior margin weakly bilobed, lateral margins very weakly convex to straight behind the eyes; posterior margin with two setæ, each placed some distance anterior to the actual margin; anterior margin with four setæ; eyes prominent; anterior eye separated from the anterior carapacial margin by more than the diameter of the eye, eyes of each pair separated by about one-half the diameter of the eye; carapace smooth except for netlike markings along the side and weakly developed granules behind the eyes; length of carapace 1.08 mm.; posterior and greatest width about 0.9 mm.; ocular width 0.5 mm. **Abdomen** much wider than carapace; lateral margins gently convex; length 3.55 mm., greatest width 1.9 mm. **Tergites** light brown in color, surface virtually smooth; first tergite with four setæ, central tergites with six to eight setæ; all tergites undivided. **Sternites** smooth, light brown in color; most sternites with eight, some with six or 10 marginal setæ.

**Chelicera** moderately deep brown in color; base fairly stout and marked by a few netlike lines on the exterior surface; all setæ long and acuminate; flagellum of four stout blades, each with an almost smooth margin; chelicera 0.29 mm. long, base 0.175 mm. wide. **Fixed finger** with wide and evenly convex lamina exterior; distal one-
half of inner margin with five or six retroconical teeth, two other teeth in the inner margin of the apical tooth; terminal plate of serrula interior spinelike, the next three conical, others fused into a velum, all teeth with entire margins. *Movable finger* fairly stout, a little curved; subapical lobe much smaller than the apical tooth and located very close to the latter; serrula exterior of about 20 ligulate plates (exact count prevented by broken plates); galea (Fig. 4) trifid near base, each branch simple and fingerlike; galeal seta fairly stout and not reaching to the tip of the galea; movable finger 0.26 mm. long.

*Palps* (Fig. 5) moderately stout, deep reddish brown in color; setae acuminate; surface of podomeres very weakly granular, with the granules minute and hardly discernible on the extensor surfaces of all podomeres except the trochanter; chelal fingers with surface smooth. Maxilla 0.54 mm. long, 0.38 mm. wide; trochanter with conical extensor protuberance and a more rounded subdorsal one, granules of the extensor side confined to the protuberances; length of trochanter 0.54 mm., width 0.31 mm.; femur 0.88 mm. long, 0.35 mm. wide; tibia 0.92 mm. long, with 0.37 mm. Chela from the dorsad with hand stout, fingers gently curved and well separated from the hand; chela without pedicle 1.58 mm. long, 0.55 mm. wide; chelal hand exclusive of the pedicle 0.85 mm. long, 0.49 mm. deep; movable finger 0.8 mm. long. From the side, chelal hand (Fig. 6) subcylindrical; basal margin rounded and blended into the dorsal and ventral margins without interruption; fingers fairly slender; each finger with about 60 marginal teeth distributed along almost the entire finger margin; teeth of the distal portion of each row retroconical and with well-developed cusps, those of the proximal end of each row rounded and acuspid.

The *legs* deep yellow in color; fairly stout; surface apparently not sculptured; setae long and acuminate, more numerous on the distal than on the proximal podomeres; tarsal claws stout. *First leg* with femoral parts stout, margins of pars basalis flatly convex, margins of pars tibialis more rounded; length of pars basalis measured along the extensor margin 0.285 mm., depth 0.185 mm.;
pars tibialis measured along the extensor margin 0.30 mm. long, 0.182 mm. deep; tibia with extensor margin nearly straight except at the proximal end, weakly convex on the flexor margin, pedicle not developed, length 0.375 mm., depth 0.118 mm.; metatarsus subcylindrical but a little narrowed distally, length 0.16 mm., depth 0.083 mm.; telotarsus like the metatarsus in shape but somewhat more slender, length 0.16 mm., depth 0.067 mm. Fourth leg with subtriangular pars basalis, length 0.315 mm., depth 0.20 mm.; flexor margin of pars tibialis almost straight, extensor margin flatly convex with a distinct angulation near the basal end, length measured along the extensor margin 0.78 mm., depth 0.335 mm.; entire femur 0.93 mm. long; tibia and tarsal podomeres with shape much like the corresponding podomeres of the first leg; tibia 0.62 mm. long, 0.175 mm. deep; metatarsus 0.245 mm. long, 0.115 mm. deep; telotarsus 0.225 mm. long, 0.095 mm. deep; metatarsus with a tactile seta located on the extensor surface near the base of the podomere; telotarsus with two tactile setae, one located 0.045 mm. and the other 0.125 mm. from the proximal margin.

Genital complex very simple. Second sternite or anterior operculum with 11 small marginal setae; third sternite or posterior operculum with five marginal setae. Small median and lateral cribiform plates present.

Type locality. The female holotype from Mullewa, Western Australia. Collection made by Dr. W. M. Wheeler on September 20, 1931.

Remarks. Xenolpium granulosum appears closely related to O. amboinensis Chamberlin, 1930, from the Dutch West Indies. The two species differ by the more slender chela, the basally less truncate chelal hand, and the larger size of the body in O. granulosum.

Family GARYPIDÆ Hansen 1894
Subfamily Garypinae Simon 1879
Genus Garypus L. Koch 1873
Garypus longidigitus sp. nov.
Figures 7, 8

Female. Body large, stout, 4.4 mm. long; appendages long and slender. Carapace light brown in color; surface
granular and marked by netlike lines; anterior margin bilobed, lateral margins weakly convex; eyes large, the eyes of one side separated by less than one ocular diameter; eyes removed from the anterior carapacial margin by between two and three ocular diameters; transverse furrows weakly developed; setae scattered, fairly numerous; length of carapace 1.28 mm., greatest width posteriorly and equal to 1.1 mm., ocular width 0.7 mm. Abdomen oval-elongate, length 3.1 mm., width about 1.9 mm. Tergites 2 to 10 divided; surface sculptured as on the carapace; brown in color; setae weak and short; first tergite with 10 setae, half-tergites of central and posterior part of body with six or seven setae along the posterior margin and two or three setae along the lateral margin; intertergal membranes and median membranes between half-tergites continuous, wide, and marked by wavy striations. Sternites 4 to 10 divided; very lightly pigmented, especially anteriorly; sculpturing scalelike or netlike and much more weakly developed than on the tergites; setae short, fine, more or less similar in number and arrangement to those of the tergites; intersternal membranes like those of the tergites. Pleural membranes wide, marked by rugose or papillose striations. Stigmata placed entirely in the pleural membranes and not on the sclerotic sternal halves.

Chelicera fairly stout, yellowish brown in color; length 0.36 mm., width of base about 0.215 mm. Base quadrate; inner margin with a deep sinuation between the base and the fixed finger; setae is, ls, and sb located on the promixal half of the fixed finger; dorsal surface of base weakly sculptured by netlike lines. Flagellum with three stout and much flattened blades; the posterior blade two-thirds as long as the anterior one, the central blade intermediate in length; each blade denticulate, with the teeth long, slender, irregular in distribution and length, and confined to the distal two-thirds of each blade. Fixed finger very convex, with well-rounded lamina exterior; apical tooth very dark brown and sclerotic, with two small denticles on the inner surface; inner margin of finger with one or two stout, sclerotic, retroconical distal teeth followed
proximally by three to five weaker, non-sclerotic, retroconical teeth becoming progressively smaller in size; distal plate of serrula interior spinelike and directed anteriorly. *Movable finger* gently curved; apical tooth acute, darkly pigmented, and sclerotic; subapical lobe subdivided distally into two acute teeth; galeal seta inserted at the level of the subapical lobe and not reaching to the tip of the galea; serrula exterior partly broken but probably composed of about 25 ligulate plates; galea stout, fairly straight, with six slender and gently curved simple rami confined to the distal one-third; length of movable cheliceral finger about 0.31 mm.

*Palps* (Fig. 7) slender; yellowish brown except chela reddish brown; surface of podomeres except the chelal fingers marked by netlike lines and granulations; setæ fairly numerous, short, acute, slightly curved, and inconspicuous. Maxilla 0.78 mm. long, about 0.5 mm. wide; trochanter 0.65 mm. long, 0.38 mm. wide; femur 1.65 mm. long, 0.318 mm. wide; tibia 1.38 mm. long, 0.35 mm. wide; chela without pedicle 2.65 mm. long, 0.65 mm. wide; depth of chela 0.59 mm., length of hand without pedicle 1.1 mm.; length of movable finger 1.65 mm. Shape of chela from the side and the arrangement of tactile setæ as shown in figure 8. Marginal teeth of chelal fingers cuspid, arranged along the entire finger margin; about 85 teeth on the fixed finger, about 70 teeth on the movable finger; teeth near each end of the row on each finger more or less conical, those of the center of the row on the fixed finger retroconical, those of the center of the row of the movable finger retroconical to much flattened so that they are much less acute than the opposing teeth of the fixed finger.

*Legs* very slender; deep yellow in color; surface marked by netlike lines; setæ like those of the palpi, except longer and more numerous on the flexor surfaces of the tibial and tarsal podomeres. *First leg* with stout trochanter, 0.33 mm. long, 0.235 mm. deep; pars basalis slender, flexor margin nearly straight, extensor margin convex in the center, podomere deepest near the distal end, length measured along the extensor margin 0.62 mm., depth 0.185 mm.; pars tibialis subcylindrical, length measured along
the extensor margin 0.39 mm., depth 0.18 mm.; tibia with extensor margin convex, flexor margin concave, deepest at the distal end, length 0.57 mm., depth 0.135 mm.; metatarsus subcylindrical in shape, length 0.38 mm., depth 0.105 mm.; telotarsus 0.345 mm. long, 0.1 mm. deep. *Fourth leg* with trochanter 0.55 mm. long, 0.24 mm. deep; pars basalis subtriangular in outline, 0.395 mm. long, 0.215 mm. deep; pars tibialis with very weakly convex flexor margin continuous with the margin of the pars basalis, extensor margin weakly to flatly convex but a little more convex basally than distally, length measured along the extensor margin 0.995 mm., depth 0.275 mm.; entire femur 1.25 mm. long; tibia shaped as in the first leg but much more slender, length 0.98 mm., depth 0.15 mm.; metatarsus subcylindrical but a little narrower across the distal than the proximal end, length 0.48 mm., depth 0.13 mm.; telotarsus 0.38 mm. long, 0.12 mm. deep.

*Genital complex* simple; anterior operculum with 17 setae, many of which are arranged in a row along the posterior margin; posterior operculum or third sternite with eight setae forming a single row; lateral cribiform plates smaller than the somewhat fragmented median plate.

Type locality. Weier, Murray Islands, Torres Strait, Queensland. Collection made by H. L. Clark on October 4, 1913. Unfortunately, no ecological data accompany the single individual (holotype) in the collection.

Remarks. This is the first record of the genus *Garypus* L. Koch from the Australian region and its occurrence fulfills a prophecy made by Chamberlin (1934) that the genus should be present in Oceania.

*Garypus longidigitus* is readily separated from other species of the genus by the characteristics, especially the length : width ratios, of the palpal prodoromeres. The very long and slender chelal fingers are among the most significant of the diagnostic features.

Genus *Synsphyronus* Chamberlin 1930


*Synsphyronus* + *Maorigarypus* Chamberlin, 1931, Stan-
of Univ. Publ., Univ. Ser., Biol. Sci., 7(1) : 135, 153, 155, 208, 215, 228 (figs.).

_Synsphyronus_ Chamberlin + _Synsphyronidae_ Beier + _Maorigarypus_ Chamberlin, Beier, 1932, Das Tierreich, 57: 226, 238.


_Genus emendatus._ On studying in detail the new species described below, it becomes obvious that the species belong to the genus _Synsphyronus_ in spite of the presence of seven, instead of eight or nine, tactile setae on the fixed finger of the palpal chela. Since Chamberlin (1943) has shown that the variable number of tactile setae is not a useful diagnostic character in this genus, there is no justification for the erection of a new genus. As a result, the genus _Synsphyronus_ is hereby emended to include forms that have seven to nine tactile setae on the fixed chelal finger.

The presence of seven setae on the fixed chelal finger indicates relationship to the genus _Anagarypus_ Chamberlin, 1930. However, the nature of the vestiural setae of the palps and the position of tactile seta _est_ of the fixed chelal finger preclude assignment of the present three species to the genus _Anagarypus._

_Synsphyronus (Maorigarypus) niger_ sp. nov.

_Figures_ 9, 10

Male. Body, legs, and chelicerae brown in color; palpi dark reddish brown; sculpturing of body and appendages as in the genus; length of body 3.6 mm. _Carapace_ as in the genus; eyes of each side separated by about the lesser diameter of the anterior eye; carapacial furrows not evident; posterior margin with four setae; length of carapace 1 mm., greatest width across the posterior margin and equal to 1.1 mm., ocular width about 0.6 mm. _Tergite_ 1 with six setae; each half of tergite 2 and tergite 3 with three setae, more posterior tergites with four or five setae on each half; tergal setae subclavate to clavate. _Sternites_ with setae acuminate to terminally truncate; setae similar to those of the tergites in number and arrangement; con-
tral sternites not divided, anterior and posterior ones divided. *Abdomen* stout, 2.6 mm. long, about 1.85 mm. wide.

*Chelicera* with chaetotaxy and flagellum as in the genus; length of chelicera 0.25 mm., width of base about 0.16 mm. Inner margin of fixed finger with three or four retroconical teeth, inner margin of apical tooth of fixed finger with two small denticles. *Movable cheliceral finger* a little curved; subapical lobe very near the base of the apical tooth; serrula exterior of 18 ligulate plates; galea relatively short, simple, stout, terminally rounded and without rami; length of movable finger 0.19 mm.

*Palps* (Fig. 9) very similar in outline to those of other species of the genus. *Setae* of maxilla chiefly acuminate; setae of the trochanter, femur, and tibia distinctly clavate; setae of the chelal hand subclavate to clavate; setae of the fingers acuminate and relatively long. Maxilla 0.60 mm. long, 0.34 mm. wide; trochanter nearly square in outline with the pedicle short and stout, length including pedicle 0.47 mm., greatest width taken at about a right angle with the longitudinal axis 0.37 mm.; femur 1.07 mm. long, width 0.30 mm.; tibia 0.81 mm. long, 0.325 mm. wide; chela basally truncate and little convex, fingers very slender in relation to the hand and gently curved; length of chela without pedicle 1.52 mm., width 0.44 mm.; length of hand without pedicle 0.83 mm., depth of chelal hand 0.36 mm.; length of movable finger 0.70 mm. *Marginal teeth* of the chelal fingers conical to retroconical in the distal part of the row of each finger, much flattened in the proximal portion of each row; cusps poorly developed; about 35 teeth on the movable finger, about 45 on the fixed finger. *Tactile setae* arranged as shown in figure 10.

*Legs* dark brown in color, with the more distal podomeres somewhat dusky; setae of femoral parts and the extensor margins of the more distal podomeres clavate, being conspicuously long and club-shaped on the tarsal podomeres of the fourth leg; setae of the flexor surface of the tibial and tarsal podomeres acuminate; tarsal claws moderately stout. *First leg* with trochanter 0.245 mm. long, 0.175 mm. deep; pars basalis with flexor margin more or less evenly convex, 0.253 mm. long, 0.163 mm.
deep; pars tibialis with evenly convex extensor margin, flexor margin bulging near the center; length 0.285 mm., depth 0.19 mm.; tibia as in other species of the genus, length 0.335 mm., depth 0.125 mm.; metatarsus subcylindrical, length 0.158 mm., depth 0.095 mm.; telotarsus with both margins a little convex, length 0.145 mm., depth 0.075 mm. Fourth leg with extensor margin of the trochanter evenly convex, length 0.365 mm., depth 0.17 mm.; pars basalis subtriangular in shape, 0.265 mm. long, 0.19 mm. deep; pars tibialis with extensor margin more or less evenly but not strongly convex, flexor margin nearly straight and continuous with the flexor margin of the pars basalis, greatest length 0.61 mm., depth 0.245 mm.; entire femur 0.80 mm. long; tibia very weakly S-shaped, length 0.49 mm., greatest depth in the distal half and equal to 0.14 mm.; metatarsus subcylindrical, 0.195 mm. long, 0.102 mm. deep; telotarsus stout, length 0.19 mm., depth 0.10 mm.

Genital complex with the anterior operculum asetaceous except for six small acuminate setae just anterior to the genital pore; posterior operculum with seven or eight small setae approximate to the genital pore and five longer setae along the posterior margin. Both opercula with numerous slitlike lyrifissures.

Type locality. The single male, the holotype, collected by Dr. P. J. Darlington on November 30, 1931, at Adelaide, South Australia.

Remarks. The present species differs from all previously described species of the subgenus Maorigarypus by having two rather than one or three tactile setae on the movable chelal finger and differs from all described species of the genus Synsphyronus by having only seven tactile setae on the fixed chelal finger. Synsphyronus niger is similar in these characters to S. magnus described below. Methods of separating these two species will be given under the description of the latter.

Synsphyronus (Maorigarypus) magnus sp. nov.
Figures 11, 12

Female. Very large; body ovate in general shape; abdomen, carapace, and legs light to medium brown; palpi
deep reddish brown; sculpturing as typical in members of the genus; body 4.45 mm. long. *Carapace* as in the genus; anterior eye of each side narrowly elliptical and separated from the posterior eye by about twice the lesser diameter of the anterior eye; a heavily sclerotized keel or ridge between the eyes, reaching its greatest development at the anterior border of the posterior eye; anterior eye removed from the anterior carapacial margin by a distance equal to four or five times the diameter of the posterior eye; lateral margins of carapace gently and evenly convex; posterior margin with six marginal setae; length of carapace 1.35 mm.; greatest width along the posterior margin and equal to 1.5 mm.; ocular breadth about 0.8 mm. *Tergites* 2 through 10 divided; tergites 4 through 10 with each tergal half marked by a centrally located and more deeply pigmented spot; setae subclavate, terminally truncate but not much widened; tergites 1 and 2 with eight setae; other tergites with 10 to 16 setae. *Sternites* 5 through 10 marked by pigmented spots similar to those of the tergites; division of some sternites weakly indicated; sternite 4 with eight marginal setae; setae of other sternites ranging from 10 to 14; setae of anterior sternites acuminate, some setae of posterior sternites weakly subclavate. *Abdomen* stout; 3.1 mm. long, about 2.5 mm. wide.

*Chelicera* as usual in members of the genus; longest blade of flagellum with three or four slender and long dentations placed a little distal to the midpoint; length of chelicera between 0.35 and 0.36 mm., width of base 0.21–0.22 mm.; length of movable finger about 0.26 mm. *Fixed finger* with relatively narrow lamina exterior; four retroconical teeth on the distal half of the inner finger margin, two smaller denticles on the inner margin of the apical tooth. *Movable finger* little curved; subapical lobe poorly developed, located approximate to the apical tooth; apical tooth little sclerotic; galea gently curved, simple, stout, terminally rounded and blunt, with conspicuous gland ducts passing from the base to the tip; serrula exterior of 19 ligulate plates; galeal seta not reaching nearly to the tip of the galea.
Palps (Fig. 11) with sculpturing and general shape of podomeres as usual in members of the genus; setae of the maxillae weakly subclavate like those of the tergites; setae of all other podomeres of the palp, including both margins of the chelal hand, short, stout, clavate, and fairly numerous; setae of the chelal fingers acuminate. Maxilla 0.81 mm. long, 0.46 mm. wide; trochanter including pedicle 0.67 mm. long, greatest width measured at about a right angle to the longitudinal axis 0.51 mm.; femur 1.50 mm. long, 0.39 mm. wide; tibia 1.17 mm. long, 0.42 mm. wide; length of chela without pedicle 2.05 mm., width 0.63 mm.; length of hand without pedicle 1.16 mm., depth 0.53 mm.; length of movable fingers 0.97 mm. Marginal teeth of chelal fingers weakly retroconical and strongly cusped in the distal part of the row, but flattened and acuspid in the proximal portion of the row of each finger; about 40 teeth on the movable finger and about 45 on the fixed finger. Movable finger with two tactile setae, the fixed finger with seven, distributed as shown in figure 12.

Legs as typical in the subgenus Maorigarypus; anterior legs stout, posterior legs relatively slender; yellowish brown in color; tarsal claws moderately stout; setae of the femur and the extensor margins of the tibial and tarsal podomeres short and subclavate to clavate, setae of the flexor margins of the tibial and tarsal podomeres acuminate and relatively long. First leg with flexor margin of trochanter evenly convex, 0.35 mm. long, 0.25 mm. deep; pars basalis with both extensor and flexor margins weakly convex, the flexor flatly so, length measured along the extensor margin 0.35 mm., depth 0.24 mm.; pars tibialis subfusiform, length 0.40 mm., depth 0.27 mm.; tibia stout, the extensor margin weakly concave except in the proximal one-fourth, flexor margin convex, length 0.50 mm., depth 0.175 mm.; tarsal podomeres subcylindrical; metatarsus 0.21 mm. long, 0.13 mm. deep; telotarsus 0.225 mm. long, depth 0.11 mm. Fourth leg with extensor margin of trochanter highly arched or convex, flexor margin weakly but evenly convex, length 0.52 mm., depth 0.265 mm.; pars basalis subtriangular, 0.355 mm. long, 0.23 mm. deep; pars tibialis with extensor margin flatly convex, flexor
margin weakly concave and continuous with that of the pars basalis; length of pars tibialis measured along the extensor side 0.91 mm., depth 0.28 mm.; entire femur 1.16 mm. in length; tibia weakly S-shaped, length 0.75 mm., depth 0.18 mm.; both tarsal podomeres subcylindrical; length of metatarsus 0.275 mm., depth 0.135 mm.; telotarsus 0.28 mm. long, depth 0.13 mm.

*Genital complex* simple, opercula little differentiated; anterior operculum with eight setæ, chiefly along the medial portion of the posterior margin; posterior operculum with nine marginal setæ; cribiform plates relatively large; two median plates with one located anterior to the other, the posterior one the smaller; lateral plates subequal in size to the larger of the median plates.

Type locality. A single specimen, the female holotype, in a collection taken by Dr. P. J. Darlington in November, 1931, on the Margaret River, Western Australia.

Remarks. The present species may be separated from other members of the subgenus *Maorigarypus*, except *S. niger*, by the reduced number of tactile setæ on the fixed chelal finger and by the presence of two tactile setæ on the movable finger. From *S. niger*, *S. magnus* may be separated by the larger size of the body and appendicular podomeres, differences in shape of the palpal tibia, and differences in the nature of the carapacial eyes and the teeth of the chelal fingers, as well as other specifically significant characteristics.

**Synsphyronus (Synsphyronus) callus** sp. nov.

Figures 13–15

Female. Description based on two individuals, the holotype and one female paratype. Measurements of the paratype are given in parentheses immediately after the corresponding measurements for the holotype whenever the two show significant difference. Body ovate; body, carapace, and legs light to moderately brown; palps deeper brown in color; sculpturing as typical in members of the genus; anterior legs somewhat stout, posterior legs relatively more slender; body 3.3 (3.25) mm. long. *Carapace* as usual in the genus; eyes of each side separated by
about the diameter of the anterior eye, a sclerotic keel or ridge just anterior to the posterior eye; anterior eye of each side more or less circular in outline, posterior eye a little elliptical; four setae along the posterior margin of the carapace; carapace 0.9 (0.95) mm. long, 0.1 mm. wide; ocular breadth about 0.55 mm. Tergites except the first divided; tergites 1 and 2 with four setae, greatest number of setae on any tergite is eight; all setae subclavate; tergites 4 through 10 with a pigmented spot on each half-tergite. Sternites 4 and 5 nearly entire, sternites 6 through 10 divided; sternites 5 through 10 with darkly pigmented spots much as on the tergites; most sternites with six setae, a few with eight setae; setae of anterior sternites usually acuminate, those of posterior sternites weakly subclavate. Abdomen oval in general shape, length about 2.4 mm., breadth about 1.9 mm.

Chelicera as usual in the genus; flagellum with the two short blades little more than one-fourth as long as the longest blade; the longest flagellar blade with one to three slender denticles near the center of the anterior margin; length of the chelicera about 0.23 mm., width of base 0.15 to 0.16 mm.; movable finger 0.165 (0.185) mm. long. Fixed cheliceral finger with three retroconical teeth on the distal half of the inner margin; inner margin of the apical tooth nearly edentate; apical tooth stout, terminally blunt; lamina exterior narrow. Movable cheliceral finger little curved, outer margin nearly straight; sub-apical lobe blunt, not well developed, approximate to the apical tooth in position; serrula exterior of 19 to 21 ligate plates (condition and position of specimens preclude exact count); galea broken in all specimens, but evidently stout.

Palps (Fig. 13) with setae of maxilla acuminate to sub-clavate; setae of chelal fingers acuminate; all other palpal setae clavate and relatively long; podomeres with the usual pseudoderm and sculpturing. Maxilla 0.47 (0.49) mm. long, 0.30 mm. wide; trochanter 0.42 mm. long, width at right angles to greatest length 0.34 (0.33) mm., width across the distal end 0.27 mm.; femur 0.98 mm. in length, 0.245 (0.25) mm. in width; tibia with length 0.73 (0.74)
mm., width 0.27 (0.28) mm.; length of chela without pedicle 1.38 (1.43) mm., width 0.39 (0.375) mm.; chelal hand without pedicle 0.68 (0.7) mm. long, 0.33 mm. deep; movable finger 0.7 (0.75) mm. in length. Chelal teeth retroconical and cuspid at the distal end of the row of each finger, conical to rounded and acuspid at the proximal end of the row; fixed finger with 45 to 50 teeth, movable finger with about 35 teeth. Movable finger with one tactile seta, fixed finger with seven; setae distributed as indicated in figure 14.

**Legs** as in the subgenus *Synsphyronus* except that the tarsus of one or more legs may have a suture dividing the tarsus into two parts, which, however, are never articulate; incompletely fused metatarsus and telotarsus may occur on the same animal as has some of the tarsal podomerses completely fused; tarsal claws stout; pedal chaetotaxy much as in *S. niger* described above. *First leg* fairly stout; trochanter 0.235 mm. long, 0.16 mm. deep; pars basalis with extensor margin nearly straight, flexor margin weakly convex, length 0.26 mm., depth 0.135 mm.; pars tibialis with extensor margin nearly straight except near the proximal end in the holotype but somewhat evenly convex in the paratype, flexor margin moderately convex, length 0.25 mm., depth 0.16 mm.; tibia with extensor margin nearly straight, length 0.31 mm., depth 0.105 mm.; miotarsus (fused metatarsus and telotarsus) 0.285 (0.305) mm. long, 0.08 mm. deep. *Fourth leg* relatively slender; trochanter about 0.34 mm. long (broken in holotype and length not determined), 0.16 (0.17) mm. deep; pars basalis with a slight protuberance at the distal end of the nearly straight flexor margin, 0.275 mm. long, 0.16 mm. deep; pars tibialis with extensor margin a little flatly convex except at the ends, flexor margin nearly straight, length 0.55 (0.54) mm., depth 0.19 (0.185) mm.; entire femur 0.75 (0.74) mm. long; tibia weakly S-shaped, length 0.52 mm., depth 0.115 (0.11) mm.; miotarsus subcylindrical or a little fusiform, 0.38 (0.39) mm. long, 0.095 (0.09) mm. deep.

**Genital complex** simple, anterior operculum with six setae, posterior operculum with six (paratype) or eight (holotype) setae; two median cribiform plates, arranged
one behind the other and with two or three very small accessory plates between; lateral plates subequal to or smaller than the anterior median plate.

Tritonymph. A single nymph, probably a tritonymph. Similar to the adult in general appearance and many details; appendages stouter and, especially the palpi, a little lighter in color; body 2.4 mm. long. Carapace 0.73 mm. long, 0.89 mm. wide across the posterior margin, ocular breadth about 0.45 mm. Chelicera much as in the adult; galea (Fig. 15) bifurcated at the very tip; serrula exterior of 16 plates. Palpi in general as in the adult, except podomeres somewhat smaller and stouter; femur 0.73 mm. long, 0.195 mm. wide; tibia 0.53 mm. long, 0.23 mm. wide; chela including pedicle 1.02 mm. in length, 0.30 mm. in width; length of hand including pedicle 0.53 mm.; movable finger 0.52 mm. long. Movable chelal finger with about 25 marginal teeth; one tactile seta, probably t, located somewhat distal to the midpoint of the finger. Fixed chelal finger with about 35 marginal teeth; six tactile setæ present and distributed as follows: et about one-third of the finger length from the tip; it on a level about one areolar diameter proximal to et; est located a little distal to the basal one-third of the finger; ist (?) and ib situated a little more than one-fifth of the finger length from the base of the finger and separated by less than one areolar diameter; a single exterior seta (probably eb) located near the base of the finger and considerably proximal to the level of ib. Legs similar to those of the adult but podomeres smaller and somewhat stouter.

Type locality. Australia. The female holotype from a collection taken on Rottnest Island, Western Australia, in December, 1931, by members of the Harvard Australian Expedition; the female paratype collected by Dr. P. J. Darlington at Cottesloe Beach, near Perth, Western Australia, on October 17, 1931; and the paratype nymph in a collection made by Dr. Darlington on October 24, 1931, at Rottnest Island, Western Australia.

Remarks. Synsphyronus callus is unique among members of the genus by having a combination of one tactile seta on the movable chelal finger and seven tactile setæ on the fixed chelal finger.
LITERATURE CITED


EXPLANATION OF PLATES 2 AND 3

Drawings were made with the aid of a camera lucida. The tactile setae are omitted from most of the dorsal views of the palpi and the marginal teeth are omitted from the exterior views of the chelae.

PLATE 2

Fig. 1. Olpium zealandiensis sp. nov., galea, female holotype.
Fig. 2. Olpium zealandiensis sp. nov., dorsal view of palp, female holotype.
Fig. 3. Olpium zealandiensis sp. nov., exterior view of chela, female holotype.
Fig. 4. Xenolpium granulosum sp. nov., tip of movable cheliceral finger and galea, female holotype.
Fig. 5. Xenolpium granulosum sp. nov., dorsal view of palp, female holotype.
Fig. 6. Xenolpium granulosum sp. nov., exterior view of chela, female holotype.
Fig. 7. Garypus longidigitus sp. nov., dorsal view of palp, female holotype.
Fig. 8. Garypus longidigitus sp. nov., exterior view of chela, female holotype.

PLATE 3

Fig. 9. Synsphyronus niger sp. nov., dorsal view of palp, male holotype.
Fig. 10. Synsphyronus niger sp. nov., exterior view of chela, male holotype.
Fig. 11. Synsphyronus magnus sp. nov., dorsal view of palp, female holotype.
Fig. 12. Synsphyronus magnus sp. nov., exterior view of chela, female holotype.
Fig. 13. Synsphyronus callus sp. nov., dorsal view of palp, female holotype.
Fig. 14. Synsphyronus callus sp. nov., lateral view of chela, female holotype.
Fig. 15. Synsphyronus callus sp. nov., galea, nymphal paratype.
Pseudoscorpions

Hoff—Pseudoscorpions