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(The pages of the publication follow this cover sheet)

THE GENUS *NYSIUS* IN NEW ZEALAND (HETEROPTERA: LYGAEIDAE)

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Summary

Compared with the species of *Nysius* from other parts of the World, the New Zealand species are amongst the most extraordinary because of brachyptery, and a full single or double row of punctures following the claval suture.

One new species, the smallest *Nysius* known, is described and figured.

The species described as *Brachynysius convexus* Usinger 1942 is reinstated, the macropterous form is described, and both forms are figured.

Three species in this genus are now recognised in New Zealand; the main distinguishing characters are given, the male and female genitalia figured, the relationship to overseas species indicated, notes on distribution and habits are given, and a key to the New Zealand species is provided.

INTRODUCTION

For some 60 years *Nysius huttoni* White 1878, described from macropterous specimens, was the only species of *Nysius* known from New Zealand. *Lygaeus clavicornis* Fabricius 1794 was transferred from *Nysius* Dallas 1852 to *Rhyodes* Stål 1868, a genus (at first subgenus) erected for this species (Evans, 1929; Ashlock, 1967).

Usinger (1942) added *Brachynysius convexus*, and on account of the strongly convexly elevated hemelytra (which is associated with brachyptery) erected a new genus for it. Eyles (1960) study on variation and pterygo-polymorphism in populations of *N. huttoni* showed that sub-brachyptery is the common form. When he compared two sub-brachypterous female specimens from Maruia Springs just below Lewis Pass with a female paratype of *B. convexus* from Arthur's Pass, they appeared identical in structure, and this led him to synonymise *B. convexus* with *N. huttoni*. Collecting since 1960 in the southern part of the South Island has produced a series of *convexus*, and this plus a fine series of *convexus* found in the Dominion Museum, Wellington, reveals the consistency of distinguishing characters, whose significance was not evident from a single specimen (e.g. lack of pubescence, which could have been rubbed off). The Dominion Museum series was collected in 1927 and includes a macropterous male.

A tiny species found at Franz Josef lacks long erect hairs and shows that pilosity is a useful character in the New Zealand *Nysius*. *N. huttoni* has long erect hairs and short pubescence, and *convexus* has the long hairs but lacks pubescence on the hemelytra (although pubescence is present on pronotum and scutellum).

SYSTEMATICS

All references to works published since Slater's (1964) Catalogue (i.e. since 1960) are cited, plus any that do not appear in the catalogue; only those concerning synonyms (and the original descriptions) are repeated.

Nysius Dallas 1852

Dallas, List Hem. B.M. 1852 2: 551–552 (Original description). —Ashlock, Univ. Calif. Publ. Ent. 1967 48: 49–54, 10, 15 (Redescription; Figs; Genitalia; Distribution; Species list; Wing length; Chromosomes; Synonymy of subgenera *Macroparius* Stål, *Anorthuna* Strand and *Tropinysius* Wagner).
Brachynysius Usinger, Trans. R. Soc. N.Z. 1942 72: 44, keyed p. 42 (Syn. by Eyles 1960).
Hemidiptera Leon, Jena. Z. Naturw. 1890 25: 13 (Syn. by Horvath 1910).

Type species *Lygaeus thymi* Wolf 1804 (Europe, Asia, North America).

This large cosmopolitan genus contains over 100 species, the great majority of which appear to be invariably macropterous. Only the Hawaiian species *Nysius hardyi* described by Ashlock (1966) is sub-brachypterous or nearly so, and only one form is known. There is a similar species, undescribed, in the Peruvian Andes. Most species have the claval suture impunctate or with a few punctures near the base. Full double rows of punctures occur in two Hawaiian species, three European species and an undescribed species from Lord Howe Is.

The three New Zealand species are amongst the most extraordinary in that (1) both macropters and sub-brachypters occur; both forms are common in *N. huttoni*, with the sub-brachypterous form predominating (Eyles, 1960), whilst in the two South Island species macropters are a very small minority; and (2) they possess either a full single (*N. convexus* and new species) or full double (*N. huttoni*) row of punctures along the claval suture.

The genital structures of the three New Zealand species are not unusual, and fall well within the morphological limits of these structures for *Nysius* of the rest of the world. Further, they are quite similar to one another, especially the spermathecae, and these structures, as well as the punctures along the claval suture, and the brachyptery, would seem to indicate that the New Zealand *Nysius* fauna is a single monophyletic unit.

The New Zealand species of *Nysius* are distinguished from *Rhyppodes* (endemic to New Zealand) by the point of branching of vein R + M,

which is located posterior to level of apex of clavus (Figs 3 and 4), by the scarcely or gradually tapering bucculae behind level of antennal tubercles, and by the smaller size. There are many exceptions to this list of characters outside of New Zealand, but no *Nysius* in the world has a complete spermathecal flange, typical of *Rhyphodes*. These two genera are described, keyed and figured in Ashlock (1967).

In New Zealand *Nysius* the branches R and M are relatively short, with M usually closer to R than to Cu at intersection with apical margin. In *Rhyphodes* the point of branching is at or before level of apex of clavus, and the branches are relatively long, with M usually closer to Cu than to R, but sometimes equally spaced along apical margin, and rarely with M slightly closer to R.

The bucculae in *Nysius* either scarcely taper and end abruptly just before base of head (as in New Zealand species) or gradually taper between level of antennal tubercles and base of head, so that length of buccula some distance behind antennal tubercle is only reduced by half. In *Rhyphodes* the bucculae taper just before the antennal tubercle, or sharply taper at about the antennal tubercle, continuing as a low carina; there is rarely any noticeable length to the buccula behind the antennal tubercle.

***Nysius convexus* (Usinger, 1942) Valid species (Figs 1, 2, 5 and 8)**

Usinger, Trans. R. Soc. N.Z. 1942 72: 44-45 and 42 (*Brachynysius*; Original description; Key).—Eyles, Trans. R. ent. Soc. Lond. 1960 112: 53-72 (as *huttoni* in part).

Main characteristics are: with long erect hairs on pronotum, scutellum and hemelytra; absence of pubescence on hemelytra with accompanying shiny appearance; with single row of punctures along (the claval side of) claval suture.

Sub-brachypterous form (with hemelytra reaching or slightly exceeding end of abdomen): hemelytra uniformly convexly elevated, with apparent absence of intermediates. The few specimens with a slightly longer wing are still convexly elevated, pointed at the tip, but lacking the lateral convexity as the sides are almost straight like those of an upturned boat.

Colour: black or brown, with two conspicuous yellow oblong streaks following apical margin of corium, a yellow clavus (except apically), and often a yellow subcostal streak. Sometimes the pale buff colour extends over most of the corium.

Spermatheca as in Fig. 5.

Aedeagus similar to that of *N. liliputanus* n.sp. with a free gonoporal process of smaller diameter (Fig. 8).

Size: (measurements in mm) sub-brachypterous form (Fig. 1): male: length 2.5 to 3.15, width 1.1 to 1.4; female: length 2.75 to 3.40; width 1.3 to 1.7.

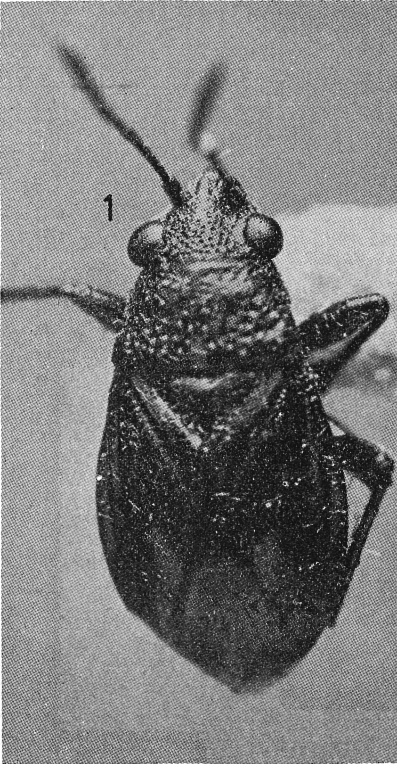


FIG. 1—*N. convexus* (Usinger) Holotype male. Dorsal view.

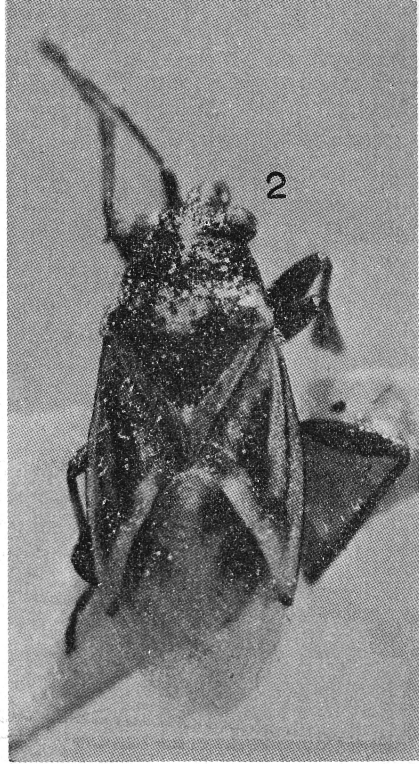


FIG. 2—*N. convexus* macropterous male from Waiho Gorge (size given in text). Dorsal view.

Macropterous male (Fig. 2): COLOUR: Antennae dark throughout; head black with mid longitudinal longish yellow spot at base; pronotum with posterior half pale except for a light brown longitudinal stripe on each side, and with mid longitudinal pale stripe before callosities; scutellum dark with pale apex; clavus pale buff coloured; corium mostly pale buff coloured as in allotype female, with brown central longitudinal stripe extending across to apical half of claval suture, a narrow brown stripe on costal edge of disc and another on extreme costal margin; membrane mostly pale with a relatively small brown area following apical margin of corium.

STRUCTURE: (measurements in mm): Head wider than long, 0.85:0.70; sides between anterior of eye and base of antenna slightly converging; eye length $2.7 \times$ distance between anterior of eye and base of antenna, 0.27:0.10; width of vertex $2.3 \times$ eye width, 0.45:0.20; antennal segments

0.32:0.60:0.45:0.55; first segment with three-eighths of its length projecting beyond tip of tylus; distance between base of antenna and tip of tylus to anteocular length, 0.2:0.3; dorsal surface punctuate; vertex gently convex; length of bucculae approximately equal to width of rostrum; bucculae gently convex, and posterior to level of base of antennae, slightly tapering to about one half of its length and ending abruptly a short distance before base of head and a little before end of first rostral segment; rostrum reaching hind coxae, first segment almost reaching base of head; rostral segments 0.52:0.45:0.37:?

Pronotum width to length, 1.20:0.75; punctate except on relatively wide callosities, the rows of punctures behind callosities more widely spaced than in sub-brachypterous specimens; sides with gentle sinuation before and behind convexity at ends of callosities; anterior margin faintly concave; posterior margin straight except for slight convexity at middle.

Scutellum width to length, 0.75:0.55; mostly strongly elevated with tri-radiate keel, and punctation in depressions between arms of keel.

Hemelytra with costal margins slightly diverging to level of apex of scutellum, than arcuate (Fig. 4); clavus with full row of punctures following claval suture (smaller punctures, not as evident as in sub-brachypterous form), but without a row on corial side of claval suture; apical margin of corium slightly sinuate; length of claval commissure 0.25; length of membrane a little less than length of corium, 1.65:1.85; lengths of basal to apical portions, before and beyond level of corial apex, 0.95:0.70; hemelytra, although much flatter than in sub-brachypterous form, still with gently convex elevation.

Size: male: length 3.6; width 1.5.

N. convexus is distinguished from *N. huttoni* by the absence of pubescence on the hemelytra, the single row of punctures along the claval suture, and by the shiny appearance. It is distinguished from *N. liliputanus* n.sp. by the presence of long erect hairs on pronotum, scutellum and hemelytra, the absence of pubescence on hemelytra, the shiny appearance, and by the larger size. Occurring mainly in the sub-brachypterous form.

DISTRIBUTION: Canterbury (Arthur's Pass), Westland (Franz Josef and Waiho Gorge, Mt Hercules and Mt Niger), W. Otago (Lake Alabaster and Haast Pass) and Nelson Prov. (Reefton Saddle), New Zealand.

MATERIAL EXAMINED: Holotype male (Fig. 1), size 2.80 × 1.35, "Arthurs Pass, N.Z., I.1923, J. G. Myers, Holotype *Brachynysius convexus*, R. L. Usinger, J. G. Myers Coll. B.M. 1937-789" (in British Museum of Natural History); allotype female, same data as holotype (in United States National Museum); plus 79 specimens (38 males and 41 females) from the following localities: WESTLAND: Waiho Gorge, 18-21.II.1927, A. Castle (19 specimens including one macropterous male); Waiho Gorge,

25-30.XII.1931, E. M. Heine; Franz Josef, moss, and moss and *Raoulia*, on glacial moraine, 198 m (650 ft), 2.XI.1965, A. C. Eyles (35 specimens); Franz Josef, moss on glacial moraine, 198 m (650 ft), 2.XI.1965, J. I. Townsend; Franz Josef, in moss, 17.II.1965, T. Wood; Mt Hercules, 184 m (600 ft), moss on bush edge under *Blechnum capense* (L.) Schlecht., and moss in bush *Weinmannia racemosa* Linn. f. and *Dacrydium cupressinum* Lamb. dominant, 1.III.1966, J. I. Townsend (10 specimens); Mt Niger, Moss, 1,829 m (6,000 ft), *Polytrichum* moss and *Celmisia hookeri* Ckn. in sample, 26.II.1966, G. Kuschel; OTAGO: Haast Pass, 562 m (1,850 ft), moss in bush under *Coprosma* and *Gaultheria*, and on roadside, 28.II.1966, G. Kuschel; head of Lake Alabaster, Pyke Valley, in moss on dry bank 11.I.1967, A. K. Walker; NELSON PROV.: Reefton Saddle, 193 m (630 ft), moss, 2.VI.1965, J. I. Townsend. In Entomology Division D.S.I.R. New Zealand, Dominion Museum New Zealand, Australian National Insect Collection, Bishop Museum, British Museum (Nat. Hist.), United States National Museum, and P. D. Ashlock collections.

OTHER RECORDS: Previously known only from three specimens from Arthur's Pass, the type locality (Usinger, 1942).

Nysius huttoni White 1878 (Figs 6 and 9)

White, Entomologist's mon. Mag. 1878 15: 32 (Original description). —Blair and Morrison, N.Z. Dep. scient. ind. Res. Inf. Ser. 1949 3: 40-42 (Damage to wheat; Fig.; Figs damaged grain). —Miller, Native Insects 1955 p. 37 (Fig.). —Cottier *In* Atkinson *et al.*, Plant Protection in N.Z. 1956 p. 253 and 341-342 (Figs; Economic importance on wheat). —Eyles, Trans. R. ent. Soc. Lond. 1960 112: 53-72 (In part; Figs; Variation; Nymphs); N.Z. Jl Sci. 1963 6: 186-207 (Fecundity; Oviposition rhythms); loc. cit.: 446-461 (Incubation period; Larval development; Number of generations); N.Z. Jl agric. Res. 1965 8: 363-366 (Damage to Cruciferae); N.Z. Jl Sci. 1965 8: 494-502 (Ecology; Host plants; Mating behaviour). —Jessep, N.Z. Ent. 1964 3(3): 20-21 (Control). —Pottinger and MacFarlane *In* Langer, The Lucerne Crop 1967 p. 234, 243 (Pest). —Ashlock, Univ. Calif. Pubs Ent. 1967 48: 16 (Chromosome number). —Harrison and White *In* Knox, The Natural History of Canterbury 1969 p. 383 (Abundance in grassland).

Main characteristics are: with complete double row of punctures following claval suture; with long erect hairs together with dense decumbent pubescence on pronotum, scutellum and hemelytra.

Spermatheca as in Fig. 6.

Aedeagus generally similar to the other New Zealand species, but differing in the shape of the two vesical lobes apical to the pigmented lobe (Fig. 9).

Size (in mm): male: length 2.38 to 3.86; width 0.94 to 1.39; female: length 2.47 to 4.34; width 1.20 to 1.75.

The combination of the complete double row of punctures following the claval suture, and the long erect hairs together with dense decumbent pubescence on the hemelytra readily distinguishes *N. huttoni* from *N.*

convexus; sub-brachypterous forms of both species are similar in structure. Variable in size, colour, and wing form. Bucculae occasionally punctate.

Many specimens of *N. huttoni* have a variegated black and pale colour pattern on the corium which will also distinguish it from the two other New Zealand species. It lacks the distinct oblong yellowish streak following apical margin in *N. convexus*, although it does have a narrow irregular shaped pale streak there. In general there is less contrast in the colour on the corium. In *N. convexus* and *N. liliputanus*, apart from the characteristic pale areas, the remainder of the corium is black or dark, whereas in *N. huttoni* the corium is usually mostly pale, or, as in the darker or variegated specimens, there is some pale (even if only small spots) over most of the corium. The femora may be spotted or almost entirely dark.

DISTRIBUTION: Throughout the North and South Islands of New Zealand, and on Stewart Island, the Three Kings Islands and the Chatham Islands.

MATERIAL EXAMINED: Macropterous female, one of the three syntypes, mounted on card, with pencil X in bottom right corner of card and underneath "N.Z. Wakefield" handwritten. It has two other handwritten labels "New Zealand. Wakefield", and "*Nysius huttoni* B.W. TYPE" both in the same handwriting, but it is not White's handwriting. There is also a printed label "Pres. by Perth Museum. B.M. 1953-629" and the word "Type" printed on white and encircled in orange. As White did not designate a type specimen in the description this specimen is hereby selected and designated Lectotype (size 4.0 × 1.7 mm) (in British Museum of Natural History); plus 920 specimens (449 males and 471 females) (mostly examined by Eyles) from the following localities: **NEW ZEALAND:** **NORTH ISLAND:** **NORTH AUCKLAND:** Spirits Bay; Waipoua State Forest, in moss; Whananaki; **AUCKLAND:** Horotiu; Kaimai; Kauaeranga Valley, Thames; Paeroa; Rukuhia swamp (Hamilton) on liverwort cushion; **SOUTH AUCKLAND:** Taumarunui; Waituhi Forest, Hauhungaroa Range, Summit 944 m (3,100 ft), moss from ground in open adjacent to *Olearia ilicifolia* Hook. f.; Whakatane; **GISBORNE:** Opotiki; Tolaga Bay; **HAWKES BAY:** Dannevirke, from pasture and roadside; Havelock North, from lawn, and under *Anagallis arvensis* L., and *Polygonum aviculare* L.; Maraekakaho, from roadside vegetation; Norsewood, from roadside; Otamauri, amongst *Brassica oleracea* L.; Porangahau from pasture; Westshore, on *Coronopus didymus* (L.) Sm.; **TARANAKI:** Dawson Falls, Mt Egmont, Hooker Hut track, 1,142 m (3,750 ft), from mixed moss; Wilkies Pool, Mt Egmont, 1,006 m (3,300 ft), moss on rock faces; **WELLINGTON:** Greytown, from pasture and roadside; Hokowhitu, from golf links, *Silene gallica* L., *Soliva sessilis* Ruiz & Pav., *Rumex acetosella* agg., *Holcus lanatus* L., *Agrostis tenuis* Sibth., and *Oxalis corniculata* Linn.;

Hunterville, from pasture; Levin, from pasture; Marton, amongst *Juncus bufonius* L.; Massey College, on *C. didymus*, on and under *P. aviculare*, on *Trifolium repens* L.; Masterton; Palmerston North; Rimutuka Saddle summit, 553 m (1,820 ft), in moss from rocky bank under *Olearia*, *Gaetheria* and *Griselinia littoralis* Raoul; Ruakokapatuna Valley, 184 m (600 ft), Wairarapa, in moss; mouth of Wharepapa stream, South Wairarapa, in moss from poor pasture on exposed cliffs; Whakapapa, 1,157 m (3,800 ft), Ruapehu, from low growing moss and mat plants on open ground with tussock, *Leptospermum*, *Nertera*, *Gleichenia circinata* Swartz, and *Coprosma cheesemanii* W. R. B. Oliver; W. side of Lake Onoke, South Wairarapa, 30.5 m (100 ft), moss under *Leptospermum scoparium* J. R. et G. Forst.

SOUTH ISLAND: NELSON: Beebys Knob nr Golden Downs; Cape Farewell, in moss; Devil's Thumb, 1,158 m (3,800 ft), Whangapeka Valley, in moss; Gordon's Knob, nr Golden Downs; Goulard Downs; 760 m (2,500 ft), Heaphy track, in moss under beech, *Coprosma* sp. in vicinity; Lewis Pass, 853.7 m (2,800 ft), in moss; Maitai R.; Maruia Springs; Mt Arthur, 914 m (3,000 ft), in moss; Nelson; one mile west of Ohikanui River, Lower Buller, from mixed moss and *Sphagnum* in swampy area; Rahu Saddle in moss; start of Rameka Track, Canaan, in mixed mosses including *Polytrichum*; Richmond; Ruby Bay; Sandy Bay inland road, 107 m (350 ft), in moss; 7 mi. E. Springs Junction, in litter; Tahunanui; Takaka Hill, 760 m (2,500 ft), in moss; MARLBOROUGH: D'Urville Island; Moud Is., Queen Charlotte Sound; Black Birch Range 1676 m (5,500 ft), Blenheim, in moss amongst *Celmisia sessiliflora* Hook. f., *Haastia pulvinaris* Hook. f., *Raoulia* and tussocks; Charwell Forks, riverbed; 5 mi. S. of Clarence River, Kaikoura, very dry lichen; Havelock, in pasture; Keke-rengu, in moss on sand dune; Kowhai riverbed; Mt Snowflake, Seaward Kaikoura Range, in thin grass cover and on high bracken fern; Upper Wairau Valley, nr Judges Creek, 944 m (3,100 ft), on lichen; Hamilton R. in moss and S. of Hamilton R., Upper Wairau Valley, moss in rough pasture, 730 m (2,400 ft); CANTERBURY: Alford forest, Staveley, bank of Bowyer's stream, in moss; Arthur's Pass, in moss under *Pseudopanax* sp.; Bealey Valley; nr Cass Peak, Banks Peninsula, in moss; Charteris Bay; Christchurch, on wheat; Culverden; Fred's stream bed, nr Mt Cook; Kea Point track, Mt Cook, *Muehlenbeckia* and moss; Killinchy, on turnips; Kirkliston Range, 1520–1,829 m (5–6,000 ft); Lake Tekapo; Lake Tekapo to Lake Pukaki, roadside; Mt Algidus, 1,308 m (4,300 ft), and 1,369 m (4,500 ft); Pudding Hill Creek, above Methven, moss amongst grass and *Raoulia*; Rakaia, young pasture and turnips; Rangiora, on bowling green; Riccarton Bush, Christchurch; Sebastopol Mt track above red lake, Mt Cook; WESTLAND: Barrack Creek, 455 m (1,500 ft),

Otira Gorge, under stones; OTAGO: Ahuriri Valley, 760 m (2,500 ft), Omarama, in moss; Ben Nevis, 914 m (3,000 ft); Benmore Hydro Road, 609-914 m (2-3,000 ft), on *Raoulia* mats; Central Otago, *Linum* sp.; Coronet Peak, 1,369 m (4,500 ft), and summit 1,475 m (4,850 ft); Cromwell; 7 mi. N. of Dunedin, 334 m (1,100 ft); Hooper's inlet, Dunedin, on tidal debris; Lake Pukaki to Omarama, roadside; Roxburgh, on *Cotula* bowling green; 3 mi. S. of Waitati, Omaru District, in moss on roadside; SOUTHLAND: Blackmount Station, on *Raoulia* in streambed; riverbed near Waiiau R., Monowai; Snowdon R. Benmore, 334 m (1,100 ft).

STEWART ISLAND: Half Moon Bay, beneath and amongst *Juncus articulatus*.

CHATHAM ISLANDS: Eastern Beach, Port Manning, litter on sand dune under *Pimelea arenaria* A. Cunn.; Hapupu, in moss; Kaingaroa Harbour, in litter under *Sonchus grandifolius* Kirk; Lake Te Roto; Mangahou Creek; Point Weeding, in litter on rock near sea spray under *Aciphylla* (*Coxella*) *dieffenbachii* (F. Muell.) Cheesem. et Hemsl., *Samolus repens* (J. R. et G. Forst.) Per., *Asplenium* and *Blechnum*; Waitangi, on sand dunes; Pitt Island; Tupuangi, in mixed bush; Pitt Island: Waipaua, moss from dry peat bog.

In Entomology Division D.S.I.R. New Zealand, Australian National Insect Collection, and authors collections.

OTHER RECORDS: New Zealand, with no locality data (White, 1878). Its distribution throughout the North and South Islands of New Zealand has been reviewed by Gurr (1957), Cumber (1959) and Eyles (1960). Its presence on the Three Kings Islands was recorded by Woodward (1954) and on the Chatham Islands by Alfken (1903) and Kirkaldy (1908).

HABITS AND ECONOMIC IMPORTANCE: Eggs are laid in the ground (Gurr, 1957; Eyles, 1963a). In the field, a natural source of food is weed species of Cruciferae (on which *N. huttoni* has been reared in captivity (Gurr, 1957; Eyles, 1963b)), but it lives on a wide variety of host plants, Portulacaceae and Linaceae (Gurr, 1957), Polygonaceae, Caryophyllaceae, Compositae, Leguminosae (Eyles, 1965b), and has been taken on Chenopodiaceae, Myoporaceae, Myrtaceae, Araliaceae and Aizoaceae (Woodward, 1954) and Rosaceae (Strawberry) (Gurr, 1957).

The data given above with material examined, indicate that there is probably some association with moss including *Sphagnum* and *Polytrichum* spp. It is possible that the bug feeds on the seeds of the recorded plants underneath which moss or litter samples were taken. The bug has been reported to be damaging a *Cotula* (Compositae) bowling green at Roxburgh (new host record). The association with Juncaceae at Stewart Island indicated a food plant; previously *J. bufonius* L. had been regarded as a shelter (Eyles, 1965b).

On *Coronopus didymus* (L.) Sm. (Cruciferae) the leaf veins, and the developing seeds are fed on (Eyles, 1963b). Because of this and the fact that the bug was reared on sprigs of this plant which may not always have had developing seeds, and because of the damage to crucifer seedlings, it is considered that seeds are not vital in the diet of this species. Ashlock (1967) suggested this for other species of *Nysius*.

Along with *Hudsona anceps* (White), *N. huttoni* attacks wheat in the milk ripe stage (Morrison 1938, 1939) after weeds around the edge of the crop have died off in summer (Gurr, 1957). The resultant condition known as sticky dough when baking with flour milled from bugged wheat, can be avoided by mixing so that there is less than 1% of bugged wheat in the sample (Gurr, 1957).

Greater economic loss occurs on cultivated cruciferous seedlings in which the effect of feeding punctures around the stems causes a cankerous growth of the tissues and collapse of the plant (Gurr, 1952, 1957). Bugs caged on seedlings caused distortion and then death of parts or the whole plant, and often abnormal sprouting of several meristems (Eyles, 1965a).

From the many localities when *N. huttoni* was captured away from crops, it is certain that wheat and crucifers are a secondary source of food.

N. huttoni is a very successful species in New Zealand, widely distributed, and occurring from the sea shore (tidal debris and sand dunes) to 1,830 m. The other two species appear to be confined to the western side of the South Island.

Nysius liliputanus n.sp. (Figs 3, 4, 7 and 10)

COLOUR: Black or slate grey, with small pale corial mark, and covered with fine silvery grey pubescence. Head with small yellow spot at base in middle; first antennal segment dark, or fawn in middle with apex and base black; second and third segments greyish-black; fourth segment greyish-black, with apex light brown; rostrum dark; bucculae black except for narrow yellowish apical stripe (sometimes partly obsolescent).

Pronotum with jet black callosities, which near sides turn diagonally forwards; with small yellow spot in middle of posterior margin (rarely absent), and sometimes narrow yellow stripe on outer half of posterior margin (sometimes on one side only); in some females whole of extreme posterior margin yellow.

Scutellum usually with extreme apex yellow. Clavus greyish-black, in some females yellow or fawn-coloured at apex. Coria in males greyish-black, with two small yellow spots, one each side on apical margin a little behind level of base of membrane (sometimes absent, sometimes with another spot each side near apex); costal margin buff-coloured. In females (rarely in males) the yellow marks are extended as two stripes following

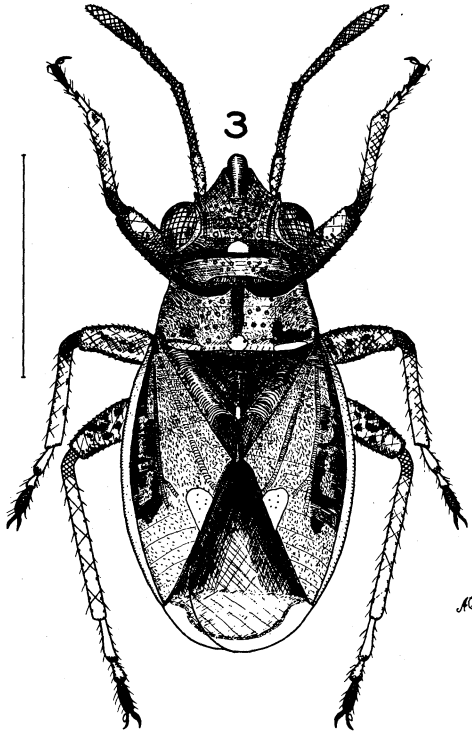


FIG. 3—*N. liliputanus* n.sp. Holotype male, sub-brachypterous. Dorsal view. Scale 1 mm.

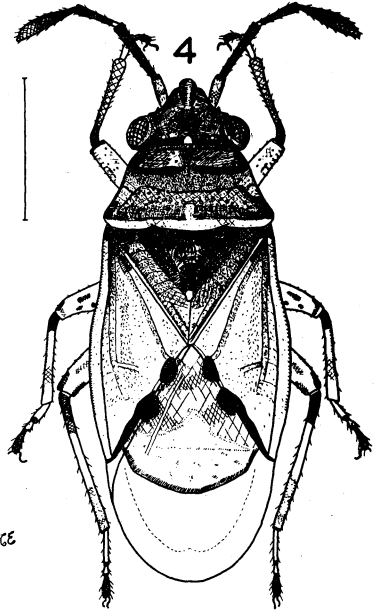


FIG. 4—*N. liliputanus* n.sp. macropterous female paratype from head of *L. Alabaster*, Pyke Valley. Dorsal view. Scale 1 mm.

full length of apical margin (in one female with only two small pale spots as in male); rarely in females most of the corium is yellowish or buff-coloured except at base and for dark stripe down centre and along edge of disc; apical margin black, with black portion encroaching onto yellow on disc in middle and near inner angle. Membrane dark or brown at base and following apical margin of corium but white and transparent apically.

Fore femur in male black with yellow spot at apex; mid femur dark brown with black spots showing through; hind femur sometimes as for mid femur, sometimes paler and spotted in basal half and dark in apical half; femora in female yellowish-orange with black or dark brown spots; tibia yellow or buff except for dark annulation near base; first two tarsomeres pale; third tarsomere brown.

Ventral surface black; coxae dark; coxal covers pale.

STRUCTURE: sub-brachypterous form (Fig. 3): (measurements in mm; mean of five males and five females, except body width and length which are the range over all specimens). Without long erect hairs on pronotum scutellum and hemelytra, but with short pubescence only. Head wider than long, 0.65:0.54 (female 0.69:0.57); sides between anterior of eye and base of antenna slightly converging; eye length $2.5 \times$ distance between anterior of eye and base of antenna, 0.25:0.10 (0.24:0.10); width of vertex $2.3 \times$ eye width, 0.35:0.15 (female $2.4 \times$, 0.38:0.16); antennal segments 0.20:0.30:0.20:0.35 (0.20:0.30:0.20:0.35); first segment with one-fourth of its length projecting beyond tip of tylus; distance between base of antenna and tip of tylus to anteocular length 0.15:0.24 (0.18:0.27); dorsal surface punctate; vertex gently convex; length of bucculae equal to width of rostrum; bucculae flat, ending abruptly a little before base of head, and a little beyond end of first rostral segment; rostrum reaching to, or a little beyond hind coxae, first segment not reaching base of head; rostral segments 0.77:1.02:0.55:0.25 (0.77:1.15:0.55:0.25).

Pronotum width to length, 0.73:0.43 (0.79:0.42); punctate except on callosities; sides more or less straight, with slight convexity opposite ends of callosities and slight sinuation immediately behind this; anterior margin straight; posterior margin with a faint sinuation each side of middle.

Scutellum width to length, 0.40:0.29 (0.43:0.28); mostly strongly elevated, with anterior arms of tri-radiate keel very broad; punctate each side of apical arm of keel.

Hemelytra with costal margins sub-parallel or slightly diverging to nearly level of apex of scutellum, then strongly convex; clavus with full row of punctures along claval suture, but corium with only three or four punctures basally, otherwise impunctate along claval suture; apical margin of corium straight for most of length, but sharply curved a little before base; length of claval commissure 0.20 to 0.25 (0.20 to 0.27); length of membrane less than length of corium, 0.78:1.00 (0.8:1.1).

Length of hind femur to hind tibia 0.64:0.68 (0.68:0.69).

Spermatheca as in Fig. 7.

Aedeagus similar to that of *N. convexus* (Usinger), but with the gonoporal process like that of *N. huttoni* White. The small pointed lobe on the dorsal conjunctival lobe is unique in the genus.

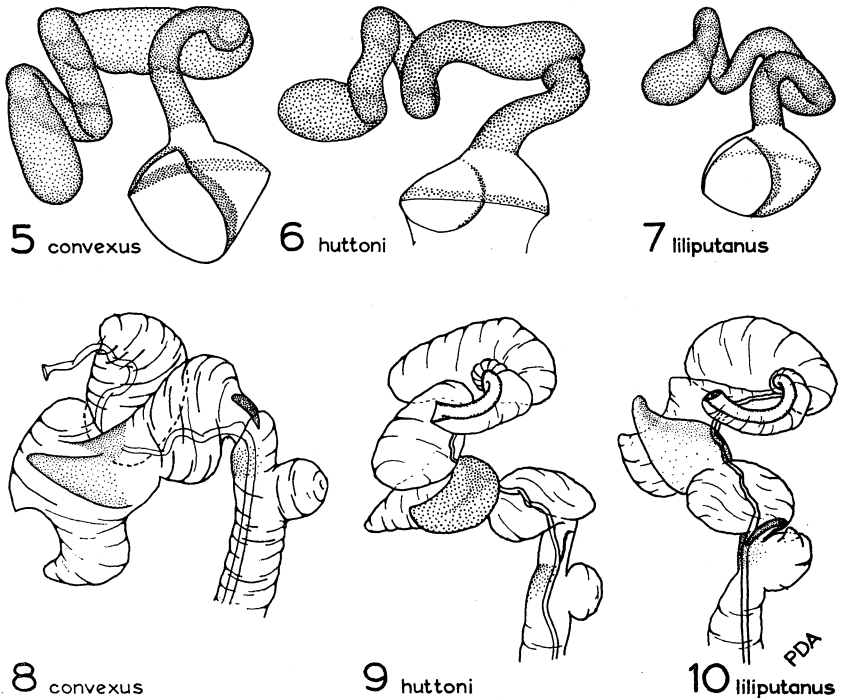
Size: sub-brachypterous form: male: length 2.0 to 2.3; width 0.90 to 1.02; female: length 2.05 to 2.52; width 1.00 to 1.18.

Macropterous form (Fig. 4): larger, but of similar proportions except that the membrane is almost as long as, or even a little longer than, the corium, and the costal margins are nearer parallel at base and then more arcuate. Membrane also dark basally, but as it is longer is mostly pale; corium in females lighter, mostly pale.

Size: macropterous form: male length 2.70 to 3.15; width 1.05 to 1.25; female: length 2.6+ (end of membrane broken) to 3.15; width 1.20 to 1.25.

Holotype male size, 2.10 × 0.95, and allotype female Franz Josef, moss on glacial moraine, 198 m (650 ft), in cop. 2.XI.1965, A. C. Eyles; plus 39 paratypes (23 males and 16 females); eight males and seven females same data as holotype; five males and three females same data as holotype except taken on moss and *Raoulia*; two females same data as holotype except collected by J. I. Townsend; one male Franz Josef, 2.XI.1965, collected at night off fern, J. I. Townsend; eight males and four females head of Lake Alabaster, Pyke Valley, dry riverbed near airstrip, 10.I.1967, A. K. Walker.

DEPOSITION OF TYPES: Holotype and allotype in Entomology Division, D.S.I.R., New Zealand. Paratypes in New Zealand, Australian National



FIGS 5-10—Spermathecae and part of aedeagi of New Zealand species of *Nysius*. FIGS 5, 6, 7—Spermathecae of named species. (Fig. 6 with membrane attached below base.) Drawings to same scale.

FIGS 8, 9, 10—Vesica and apex of conjunctiva of aedeagus of named species. Drawings to same scale.

Insect Collection, Bishop Museum, British Museum (Nat. Hist.), United States National Museum, and P. D. Ashlock collections.

Distinguished from *Nysius convexus* (Usinger) by the absence of long erect hairs, the presence of short pubescence on clavus and corium, the smaller size, and, to the naked eye, by the black colour and dull appearance.

Occurring together with *N. convexus* at both Franz Josef and Lake Alabaster.

From the type locality five macropters (three males, two females) were taken; the male taken from fern at night was also macropterous. From the Lake Alabaster locality three male and one female macropters were taken.

DISTRIBUTION: Westland (Franz Josef) and W. Otago (L. Alabaster), New Zealand.

KEY TO THE SPECIES OF *Nysius* IN NEW ZEALAND

1. With long erect hairs on dorsal surface.....2
Without long erect hairs on dorsal surface.....*liliputanus* n.sp.
2. Hemelytra with short pubescence in addition to long erect hairs; with complete double row of punctures, one each side of claval suture.....*huttoni* White 1878
Hemelytra without short pubescence, but with long erect hairs only; with single full row of punctures on claval side of claval suture.....
.....*convexus* (Usinger, 1942).

ACKNOWLEDGMENTS

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