Occurrence and nesting of the yellow oriental paper wasp, *Polistes olivaceus* (Hymenoptera: Vespidae), in New Zealand

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Abstract

A nest, founding queen, and an additional living female of the cosmopolitan yellow paper wasp, *Polistes olivaceus* (De Geer) are recorded from Dunedin, New Zealand.

INTRODUCTION

Polistes is a cosmopolitan genus of about 300 species, most of which are tropical or subtropical in distribution. Adults are slender, elongated wasps with a pointed, spindle-shaped abdomen, and show little obvious morphological differentiation into queen and worker castes. The nests typically comprise a single comb of paper cells which lack any external envelope, and are suspended from above by a slender stalk.

Two species are recorded from New Zealand. *P.humilis* (Fabr.) (Fig. 1B), a brownish, or reddish-black Australian species whose females measure about 13 mm long, has been abundant in Northland since the beginning of this century. There are ambiguous records in the literature of the presence of a second species, *P.olivaceus* (De Geer) (=*P.hebraeus* F.). *P.olivaceus* is 17–24 mm in length and therefore is very much larger than *P.humilis*, and has a body, legs, and antennae coloured ochrous-yellow and patterned with narrow brown lines, those on the abdomen being distinctive and sinuous when viewed from the side (Fig. 1A).

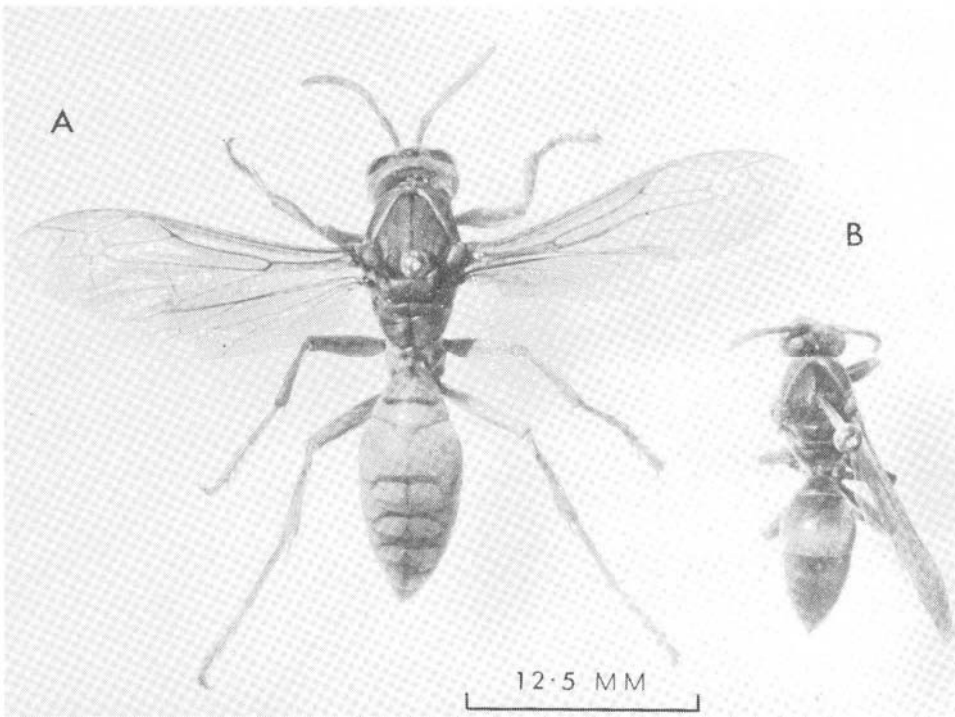

Fig. lA; *Potistes olivaeeus* De Geer; foundress queen from Dunedin. 1B, *P. humilis* Fabr.; foundress queen from Leigh, North Auckland.

DISTRIBUTION

Polistes olivaceus is native to the Oriental region, where it is known as the "common yellow wasp of India" (Horne & Smith 1872; Alam 1958) and in China as a "natural enemy of wild silkworms" (Su 1958).

During the past century it has been accidentally introduced by man (often repeatedly) into parts of the Ethiopian region, e.g., Zanzibar, Madagascar, Seychelles, and Mauritius (Baltazar 1966; Schultz 1905), and throughout the Pacific, e.g., Hawaii (Van Zwaluwenburg, Rust & Rosa 1944), Easter Island, Tahiti (Roman 1924), Sunda Islands (Schultz 1905), Marquesas Islands (Baltazar 1966), Samoa, Tonga, New Caledonia, Marianas Islands (Bequaert & Yasumatsu 1939), and Fiji (Williams 1947). It has recently become established ("perhaps only temporarily") in Queensland, Australia (Richards 1978 pers. comm.). Because of its distribution in the Pacific region, it is sometimes called "the Fiji Hornet" (Thomson 1923) or "the Pacific Island Hornet" (Miller 1971).

P. OLIVACEUS IN NEW ZEALAND

The first New Zealand records are "North Auckland, October 1921" and "Auckland, Queen Street pavement, November 1921" (Thomson 1921). Several writers (e.g. Valentine 1967) have queried these records, implying that Thomson's *"P. hebraeus"* may have been the introduced Australian species *P. humilis,* by then well established and "very common in the northern parts of New Zealand" (Miller 1919). Nevertheless a detailed earlier account of *P. humilis* by Thomson (1922) indicates that Thomson was familiar with two species of *Polistes,* and Miller (1971) stated that *P. olivaceus* occurred "about 50 years ago" in the Waikato but did not become established.

The present note is the first record of *P. olivaceus* nesting in New Zealand.

P. OLIVACEUS NESTING IN DUNEDIN

On 15 February 1978 a living *P.olivaceus* female was captured in the Otago Harbour Board office in Birch Street. An investigation of Birch Street wharf and its associated buildings by the author on 17 February 1978 revealed a further female which had built a 7-celled nest. This was located beneath the eaves of an outside toilet, at a height of about 3 m. The foundress queen was resting on the nest at the time of capture. The foundress and her nest were taken to the Otago Museum and placed in an observation cage. The two females lived until the end of February.

The nest comprised 7 cells, 6 of which surrounded a central cell suspended to the eave by a pedicel. Five cells contained eggs. These were 2.2 mm long, and were cemented to the base of the wall closest to the central, first-formed cell and inclined towards the centre of each cell. The dark brown pedicel was 6.4 mm long, and the cells on average 5.3 mm across the rim and 9.5 mm deep.

PROBABLE METHOD OF ENTRY INTO NEW ZEALAND

It is likely that *P.olivaceus* females were brought to New Zealand by the Indian cargo vessel "Vishva Bindu" the only foreign ship to berth at Dunedin within 3 months of their discovery in February. The absence on either wasp of black pigmentation is consistent with an origin in southern India. The "Vishva Bindu" arrived on 24 December 1977 direct from India and left for other New Zealand ports on 30 December 1977. Its freight consisted largely of tea and gunnies loaded on at four Indian ports. Cargo for Dunedin was similar to that bound for other New Zealand ports and comprised: ex CALCUTTA (sailed 21 Nov 1977) 1673 chests tea, 123 bales and rolls hessian cloth, 200 sacks myrabolum, 320 bales jute wool packs, 4 cases anatomical specimens; ex CHALNA (sailed 27 Nov 1977) 313 bales cornsacks; ex CHITTAGONG (sailed 2 Dec 1977) 206 bales woolhack and cornsacks, 29 bales hessian cloth; ex PORT KELAND (sailed 8 Dec 1977) 3 packages personal effects, 5 bundles sawn timber.

The cargo then travelled via Singapore direct to Dunedin, where it was stored in shed G on Birch Street wharf, until local deliveries were completed on 19 Jan 1978. From then until the end of February, shed G was unoccupied (R. K. Henderson, wharfinger, pers. comm.).

The nest and 2 adults were discovered within 60 m of the "Vishva Bindu's" former moorings, and the place where its cargo had laid. Although a month had elapsed between this discovery, and the departure of the ship and local despatch of its cargo, it is possible that the insects survived in the wharf area as a result of the unusually warm 1978 summer. The average maximum and minimum daily temperatures at Dunedin for both January and February 1978 (January: 20.3°C and 11.7°C; February 19.9°C and 11.5°C) were considerably higher than usual (A. I. Tomlinson pers. comm.).

DISCUSSION

There are many records of foreign aculeate Hymenoptera being found alive in New Zealand, and at least 4 species have become established here this century, e.g., *Cryptocheilus australis* (Guerin):Pompilidae (Harris 1974); *Podalonia suspiciosa* Smith: Sphecidae (Faulds 1977); *Polistes humilis* (F.): Vespidae (Miller 1919); *Paravespula germanica* (F.): Vespidae (Thomas 1960). As regards the last species Thomas (1960) stated "It is likely that hibernating queens were introduced into New Zealand in cases containing aeroplane parts stored at the Te Rapa Air Force Depot." The *P.olivaceus* entry would seem to be very similar. Alam (1959) stated that *P.olivaceus* females in India mate at the onset of winter, and reappear from "winter sleep" to begin nest-founding from the "last week of February to the first week of April", the exact time varying according to the severity of the winter. It therefore seems likely that fecundated females in hibernation were loaded

aboard the "Vishva Bindu" and remained quiescent in the dark hold until they were off-loaded in Dunedin, where nest-founding was induced in one of them by a combination of disturbance, sunlight, the unusually hot 1978 Dunedin summer, and the approach of the time of their re-appearance in India.

Voucher specimens have been deposited in the Otago Museum.

ACKNOWLEDGMENTS

I am very grateful to Professor O. W. Richards, British Museum (Natural History) for checking the identifications of *P. olivaceus*, to Mr R. K. Henderson, wharfinger, Dunedin, for providing detailed information on the movements and cargo of the "Vishva Bindu", Mr A. I. Tomlinson, N.Z. Meteorological Service, Wellington, for obtaining extensive climatic data, Dr. R. Cumber for comments, and Dr. Y. Kawachi and Miss A. Grant, Otago University, for Japanese and German translations.

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