New Zealand BioSecure
A division of Southern Monitoring Services

Culex (*Culex*) *annulirostris* (Skuse)

common banded mosquito

NZ Status: Not present - Unwanted Organism



Vector and Pest Status

Culex annulirostris is a vector of Murray Valley encephalitis (Kay *et al*., 1984; Lee *et al*., 1989) Japanese encephalitis (van den Hurk *et al*., 2003, Klein et al., 2024) – considered to be the primary vector for JEV in Australia (van der Hurk et al., 2022), Kunjin (Kay *et al*., 1984), Ross River virus (Harley *et al*., 2000) and Barmah Forest virus (Boyd and Kay, 2000). In most localities where Bancroftian filariasis (*Wuchereria bancrofti*) is endemic, *Cx. annulirostris* has little or no significance as a vector (Lee *et al*., 1989). However, in Irian Jaya where nocturnal periodic filariasis is prevalent, it is a major vector (Lee *et al*., 1989).

This species is also able to carry dog heartworm (Russell and Geary, 1992; 1996) and is probably a major vector of myxomatosis (Russell, 1993). Other viruses that have been associated with *Cx. annulirostris* include Alfuy, Edge Hill, Eubenangee, Gan Gan, Kokobera, Kowanyama, Rift Valley fever, Trubanaman, and Sindbis (Lee *et al*., 1989).

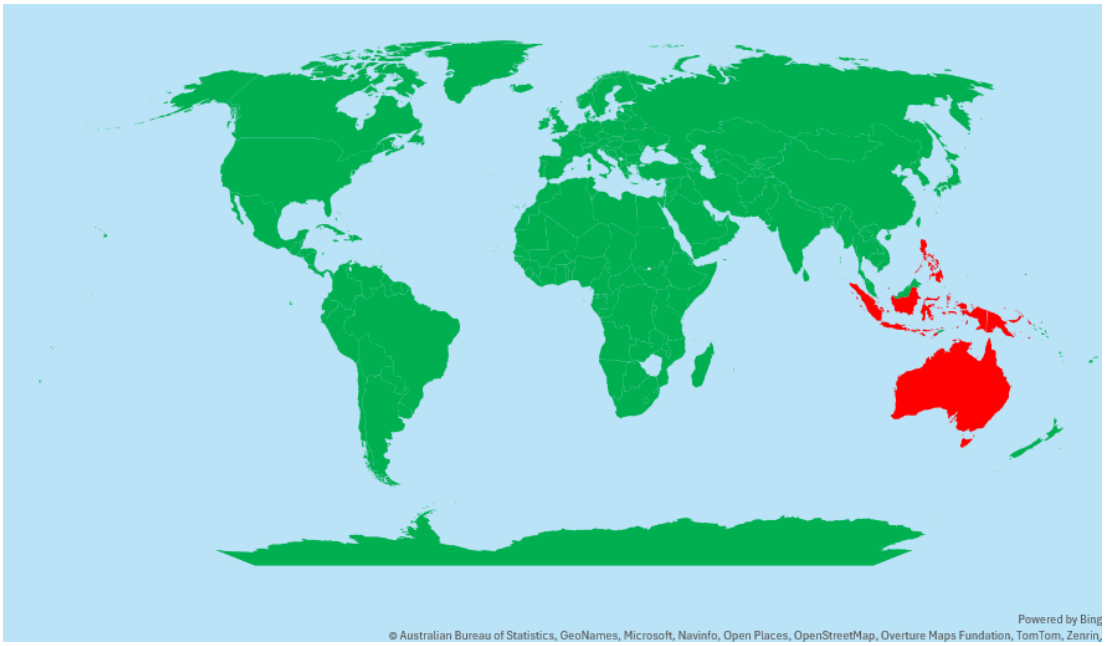
Geographic Distribution

This mosquito is found in Australia, parts of Southeast Asia and the Pacific, to the east through the island chains as far as French Polynesia, and north through Papua New Guinea to the Mañana Islands. It has been recorded from the Austral Islands, Bismarck Archipelago,

Cook Islands, Fiji, Indonesia, Kiribati, Moluccas, Nauru, New Caledonia, Palau, Philippines, Samoa, Society Islands, Rotuma Island, Solomon Islands, Tonga, Torres Strait Islands, Tuamotu Archipelago, Tuvalu, Vanuatu and Wallis and Futuna Islands (Lee *et al*., 1989).

In Australia, it is found in the coastal and inland regions of Queensland, New South Wales, Victoria, South Australia, Western Australia and Northern Territory. The situation in Tasmania is unclear with only one record (Russell, 1993, Webb et al., 2016).

It is believed that *Cx. annulirostris* would be unable to establish in cooler parts of New Zealand.



This map denotes only the country or general areas where this species has been recorded, not actual distribution.

Incursions and Interceptions

This species has been intercepted in New Zealand 11 times. The last interception in 2016 was in Auckland International Airport, a specimen was found alive together with two *Aedes vexans* and seven *Aedes vigilax* in relation to a tent (camping equipment) that was used in New Caledonia (NZBEL Interception records, 2026)

Taxonomy

Culex annulirostris belongs in Group A, the *sitiens* subgroup of the subgenus *Culex* (Lee *et al*., 1989). At present, this species is thought to be made up of five geographically restricted, divergent lineages, two of which are localised in Australia, two in Papua New Guinea, the Torres Strait and the top of Cape York, and the fifth identified from the Solomon Islands (Hemmenter *et al*., 2006).

Habits and Habitat

Culex annulirostris breeds in a variety of habitats. It is typically found in temporary freshwater pools on grassland as well as freshwater ponds, wetlands, swamps, lakes, dams, irrigated areas, drainage ditches, flooded rice fields and hoof prints (Lee *et al*., 1989). It has also been collected in some artificial containers such as a 44-gallon drum, tyres, a stock drinking trough, canoes, a swimming pool and a bath (Lee *et al*., 1989).

Kay *et al*. (1981) characterised typical larval habitats as freshwater swamps, lagoons and transient grassy pools, but also a variety of other sunlit or shaded habitats, usually with aquatic or emergent vegetation (Lee *et al*., 1989). *Culex annulirostris* has also been found in waters of salinity up to 16.3 gm total salts/litre (Woodhill, 1936 in Lee *et al*., 1989).

Eggs are laid in a boat shaped egg raft on the water surface, which usually consists of 50-200 eggs (Kay *et al*., 1981). The eggs are not desiccation resistant and will die if they become dry (Kay *et al*., 1981). In the laboratory, development from egg to adult ranged from 8.57 days at 35°C to 37 days at 15°C (McDonald *et al*., 1980 in Lee *et al*., 1989). Larval survival of this species under laboratory conditions was best at 25°C (McDonald *et al*., 1980 in Lee *et al*., 1989). In the field (in Australia), egg hatch to adult emergence took 21-32 days at water temperatures of 13-18°C (Kay *et al*., 1981).

Culex annulirostris is a crepuscular species (Williams and Kokkinn, 2005) with female adults host feeding primarily at dusk and dawn, however this species will also feed during the day and at night, attacking both indoors and outdoors (Lee *et al*., 1989). This species has been recorded feeding on humans, rabbits, dogs, fowl, cats, pigs, sheep, goats, horses, kangaroos, ox, buffalo cattle, chickens, guinea pigs, mice, brush-tailed possums, bats reptiles and amphibians (Lee *et al*., 1989).

In a mark-release-recapture study in New South Wales, the maximum flight distance observed was 12km (the limit of the trapping network). The rate of dispersal of the population was estimated at 2.2km/day, with a mean distance travelled of 4.4km, however some of the population dispersed more than 5km (Bryan *et al*., 1992).

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