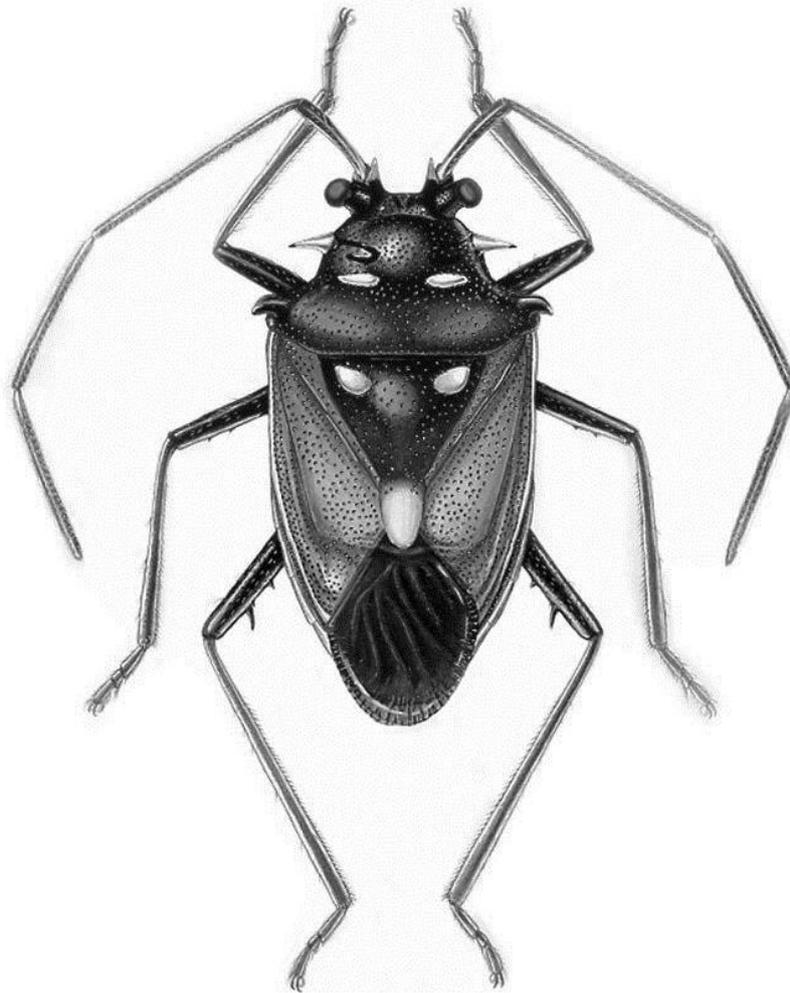
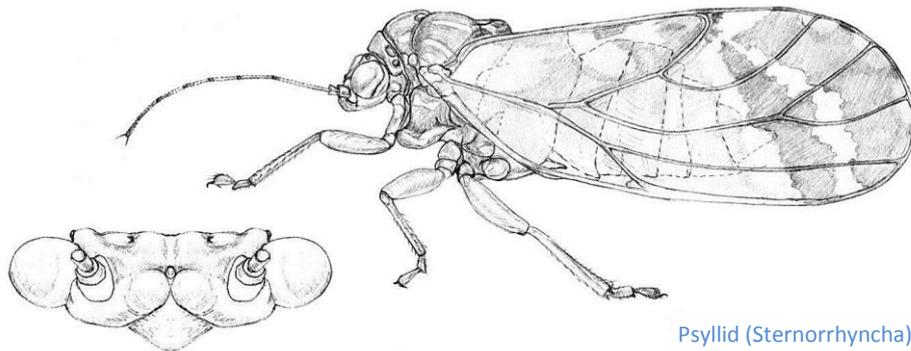


Order Hemiptera

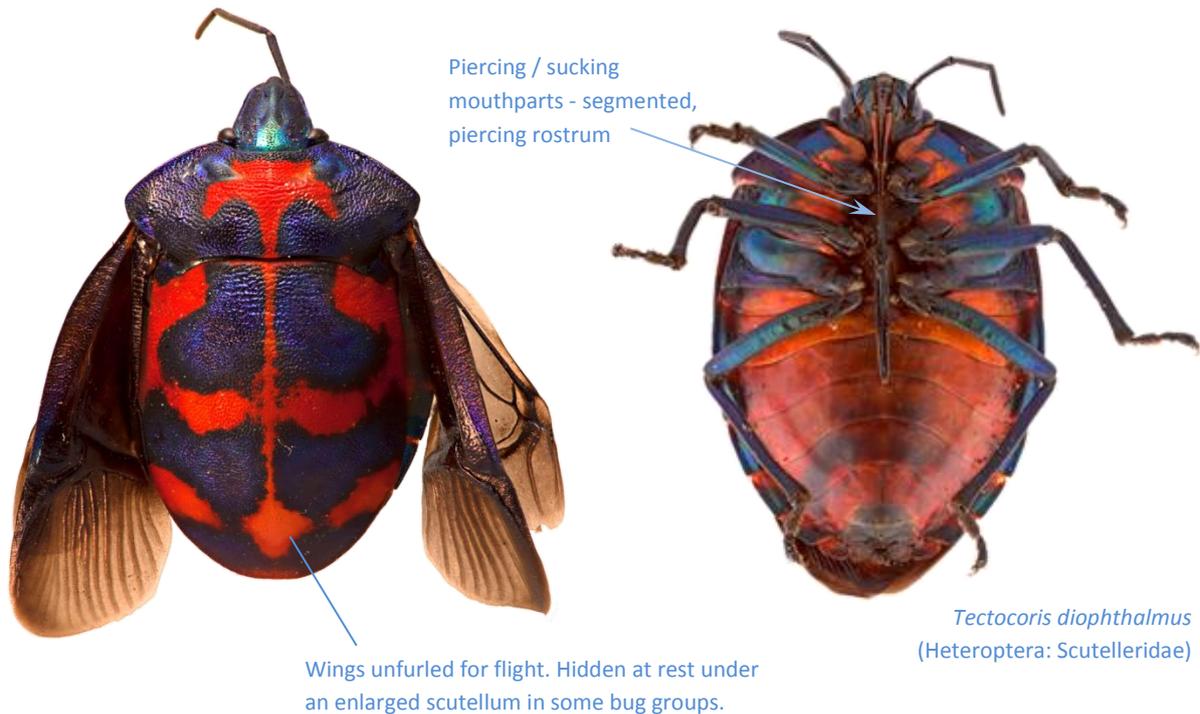


Common names: aphids, scales, whitefly, psyllids or jumping plant lice, leafhoppers, plant hoppers, treehoppers, spittlebugs or froghoppers, cicadas, true bugs, water striders, stinkbugs, seed bugs, assassin bugs, lace bugs

Simple diagnosis. Hemipterans are recognised by their piercing and sucking mouthparts, which are nearly always long and thin and in the form of a straight or weakly curved tube.



Psyllid (Sternorrhyncha)



Technical diagnosis. The order Hemiptera can be diagnosed by their proboscis-like mouthparts (=piercing and sucking), with the mandibles and maxillae modified into long and sharp stylets, that form two pairs of stylets that are interlocking, encased by a segmented labium. Maxillary and mandibular palps are nearly always absent. Their head is either hypognathous (= directed vertically; suborders Heteroptera, Coleorrhyncha), opisthognathous (= directed backwards; suborders Sternorrhyncha, Auchenorrhyncha), or rarely prognathous (= directed anteriorly; some Heteroptera). The pronotum is usually well-developed and the metasternum is most often concealed. The tarsi are most often three-segmented, but 1, 2 or 4 tarsomeres are known. In some taxa the tarsomere number varies between the legs (some Nepomorpha, some Dipsocoromorpha). Forewings are either membranous, part leathery or entirely leathery. The suborder Heteroptera (true bugs) can be identified by leathery flat forewings often membranous posteriorly, a 3-4 segmented labium and 4-5 segmented antennae. They most often have complex metathoracic glands between the middle and hind legs that have a mushroom-like texture on the outer surface of the body. Coleorrhyncha (moss bugs) are similar to Heteroptera, but the forewings are fully leathery, with many closed cells.



Auchenorrhyncha (cicadas, planthoppers, leafhoppers, treehoppers, spittlebugs) also may have leathery forewings, but they are held tent-like over the body, and the antennae are aristate (= bristle-like). In Sternorrhyncha (scale insects, mealybugs, whitefly, psyllids, aphids) the wings are membranous, and sometimes only the forewing is well-developed, with the hindwing reduced, and the mouthparts arise from near the junction of the head and prosternum. Abdominal cerci are absent. Some Sternorrhyncha, such as aphids, have a pair of siphunculi (= small tubes) on the apex of the abdomen in dorsal position.

Heteropterans often exhibit a great deal of wing polymorphism, with wings often shortened to varying degrees, which can be sexually dimorphic.

Most nymphs are similar to adults and they undergo incomplete metamorphosis. The nymphs of aphids can undergo complete metamorphosis with pupal stages, sedentary and sessile nymphs. Sternorrhyncha often have the wings reduced or absent (e.g. scale insects, mealybugs, aphids). In male scale insects (family Coccidae) only the forewings are present and the hindwings are reduced to small paddle-shaped structures (= haltere-like).

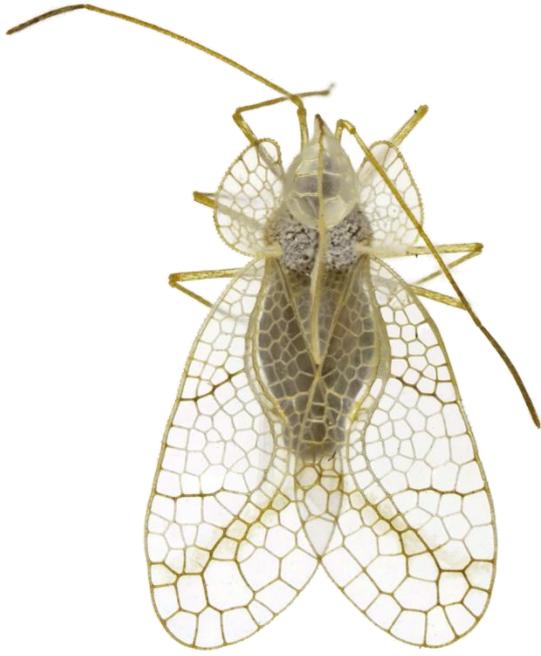
What can they be confused with? Some flies like mosquitoes and bees have a long straight tube that make up their mouthparts, but hemipterans always have their wings flat or held tent-like over their bodies.



Prodomus oculatus (Heteroptera: Miridae)



Nerthra colaticollis (Heteroptera: Gelastocoridae)



Stephanitis sp. (Heteroptera: Tingidae)



Membracid planthopper
(Auchenorrhyncha: Membracidae)

Biology. Hemipterans are found in all major ecosystems, including deserts, tropical forests, and alpine regions. Some species are aquatic or semiaquatic and some live on the open ocean. The majority of hemipterans are plant feeders, predominantly of seed plants, and some species are host plant specific. There are also many omnivorous and predacious species. There are heteropterans that feed on blood of vertebrates, including humans, such as the human bed bug.

Diversity in Papua New Guinea. Hemiptera is the fifth largest insect order and are greatly diverse in morphology and habits. They are cosmopolitan in distribution, and include about 100,000 species. Many bug groups are well represented in New Guinea but are poorly documented (Miller 2007).



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