

First Record of *Penthaleus major* (Acari: Penthaleidae) in Brazil

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NOTE

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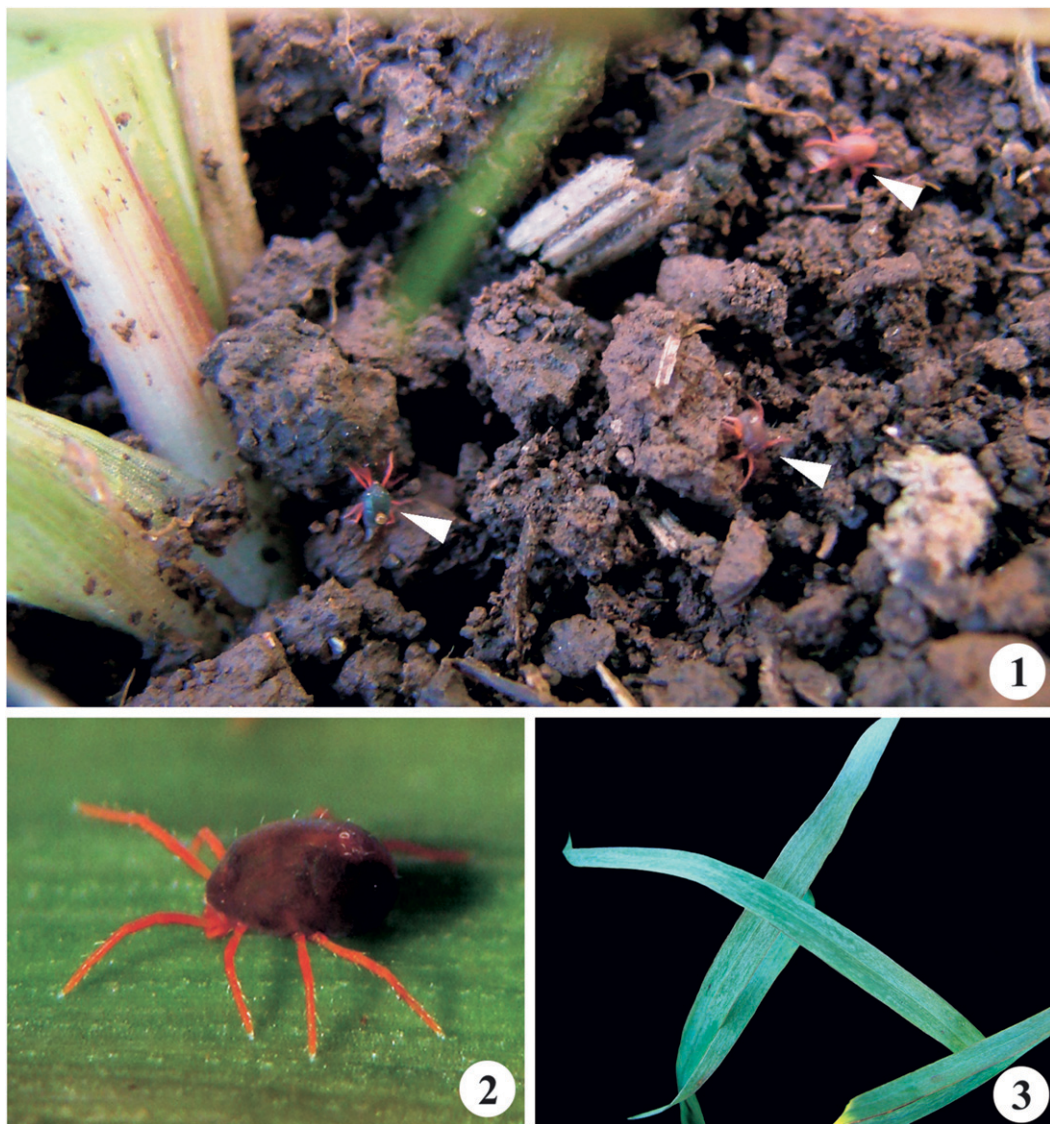
The blue oat mite, *Penthaleus major* (Dugés) (Penthaleidae), is widely distributed in the world. Its occurrence is reported in Oceania (Australia, New South Wales, Victoria, and Tasmania), Europe (Germany, Spain, France, Greenland, Iceland, Italy, Norway, and Portugal), Africa (Morocco and South Africa), North America (United States and Canada), Central America (Mexico), and South America (Argentina) (Wallace and Mahon 1971, Johansen 1986, Gudleifsson and Ólafsson 1987, Qin and Halliday 1996, Weeks et al. 2000, Gudleifsson et al. 2002, Johansen and Haug 2002, Hallas and Gudleifsson 2005, Umina 2007). The blue oat mite was regulated as a quarantine pest for Brazil in IN 41 (Brazilian Ministry of Agriculture, Livestock and Food Supply, published in 02.vii.2008). Species in the genus *Penthaleus* could probably survive in most areas in both hemispheres between the latitudes 25° and 55°, while unlikely to be found in the tropics except at high altitudes (Jeppson et al. 1975).

Penthaleus major is an important agricultural pest in Australia and other regions of the world. This polyphagous mite is primarily found on oats (*Avena* spp.) and in pastures, but occurs sporadically on wheat (*Triticum aestivum* L.), barley (*Hordeum vulgare* L.), peas (*Pisum* spp.), lentil (*Lens culinaris* Medik.), lucerne (*Medicago sativa* L.), and very rarely on canola (*Brassica napus* L.) (Weeks and Hoffmann 1999, Robinson and Hoffmann 2001, Umina 2007). The blue oat mite prefers sandy

soils and remains most of the time on leaves near the ground (Umina 2007). The damage this mite causes is due to laceration of the epidermis and removal of chlorophyll from the cells, giving a silvery appearance to the plants (Chada 1956, Narayan 1962, Hallas and Gudleifsson 2005). According to Kobayashi et al. (1991), *P. major* reduces the yield of perennial grasses.

Penthaleus major was detected attacking oat plants, *Avena strigosa* Schreb., cultivated as pasture for dairy cattle, on a private property located between the municipalities of André da Rocha and Protásio Alves in the state of Rio Grande do Sul (S -28°41'33.8"; W -51°32'17.3"), South Brazil, on July 2, 2009. Mites were observed in high numbers on soil on the edge of field crops in the early afternoon (Fig. 1). On the remaining area (around 5 ha) mites were not intercepted although symptoms of mite attack were visible. This was probably due to the chemical application of the organophosphate insecticide/miticide methamidophos to control its infestation. The mites feed on the leaf surface (Fig. 2) and damaged oat plants showed silvering leaves (Fig. 3) and reduced height. Similar symptoms were observed by Umina (2007) in Australia and by Gudleifsson et al. (2002) and Hallas and Gudleifsson (2005) in Iceland caused by infestations of *P. major*.

Mites were collected and clarified in Nesbitt and mounted in permanent microscope preparations using Hoyer medium. Specimens were identified using

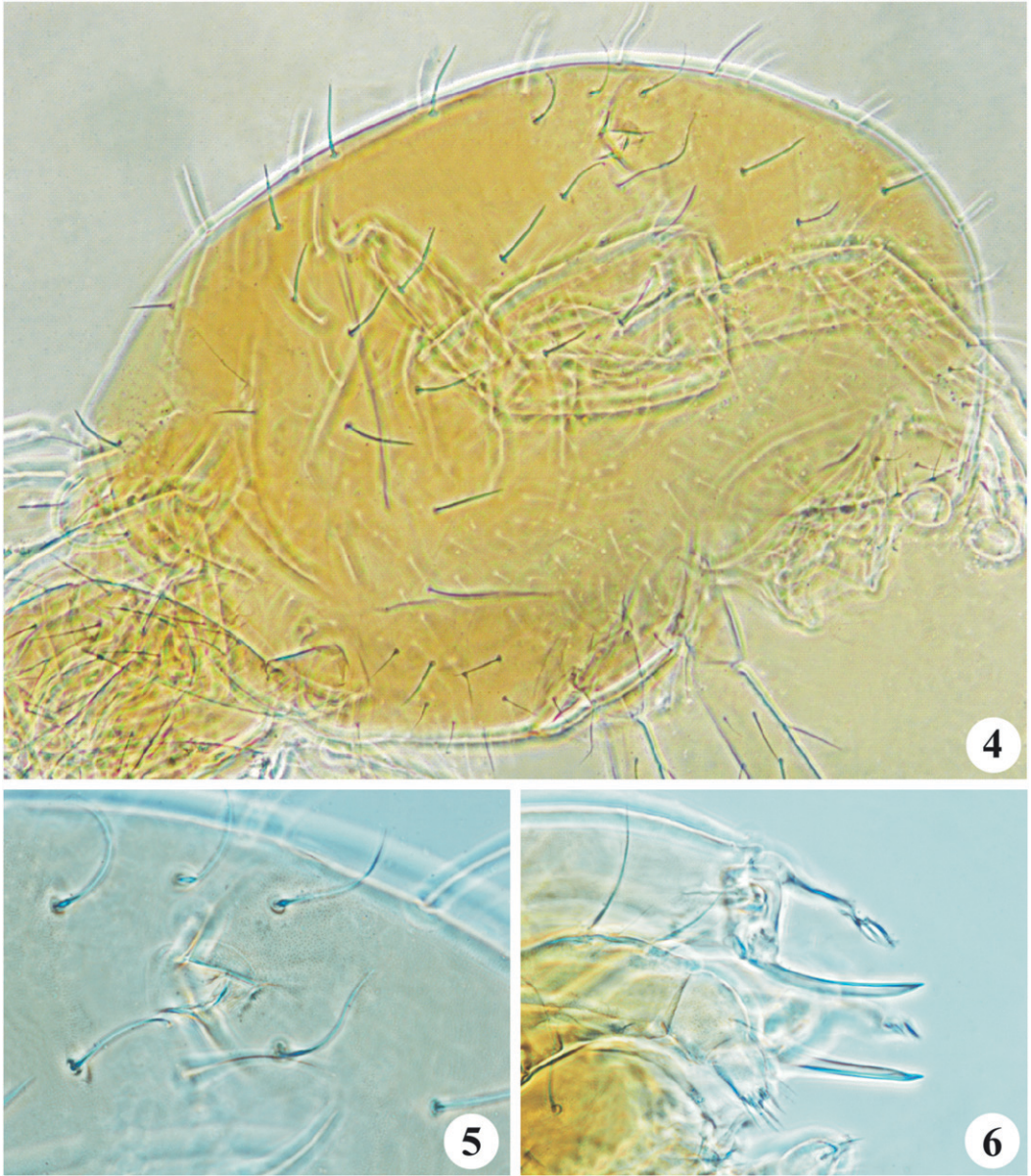


Figs. 1–3. The blue oat mite *Penthaleus major*. 1, Specimens on soil surface – arrows. 2, Adult feeding. 3, Symptoms on oat leaves.

a phase-contrast microscope (Nikon Eclipse 80i). Taxonomic identification was mainly based on Qin and Halliday (1996) (Figs. 4–6). Preserved specimens were deposited in the Reference Mite Collection, at Embrapa Recursos Genéticos e Biotecnologia, Brasília, Brazil. The presence of this quarantine pest in the country was immediately

communicated to the Brazilian Ministry of Agriculture following the regulations concerning records of new pests in the country.

Penthaleus major passes through three immature stages before reaching the adult stage (egg, larva, nymph), with two (Narayan 1962, Jepson et al. 1975) to three instars (Chada 1956). Larvae are



Figs. 4–6. The blue oat mite, *Penthaleus major*, taxonomic characters. 4, Idiosoma with long dorsal setae arranged in longitudinal rows. 5, Dorsal position of the anus (arrow). 6, Detail of gnathosoma with sickle-like chelicerae.

approximately 300 μm long, oval, with three pairs of legs. Upon emergence, they are pink-orange, changing to brownish and then to green. Nymphs are larger, having a body length between 450 and 540 μm . They also have four pairs of legs

(usually red) and vary in color from pale brown to green (Narayan 1962). Although there is no information on how *P. major* invaded Brazil, its dissemination in Rio Grande do Sul state probably occurred by natural means. The

dispersal of soil mites is not well known (Umina et al. 2004). Long-range movement is probably achieved during the summer when diapause eggs are blown by winds. Eggs may also be dispersed long distances in soil adhering to livestock and farm machinery, and through transportation of plant material (Ridsdill-Smith 1997, Umina et al. 2004). The most important natural ways in which mites are disseminated for short and medium distances are wind, animal vectors (phoresy), and passive spread by rain or by human activities. Some species of Tetranychidae and Eriophyidae are thought to exhibit a type of aerial dispersal at the adult stage, where adults adopt a specific stance and are subsequently blown by the wind (Sabelis and Dicke 1985, Fan and Pettitt 1998, Bergh 2001, Duffner et al. 2001, Bell et al. 2005). Passive dispersal (by wind) of adult earth mites is possible, although there is no evidence for this since these mites spend most of their time on the soil surface (Ridsdill-Smith 1997).

Although *P. major* has not been observed in other localities of Rio Grande do Sul state, surveys should be conducted to monitor the possible spread of this mite to other southern Brazilian states.

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