Leaf galls on an aquatic macrophyte, *Nymphoides indica* (Nymphaeaceae), in Rio Doce Valley, Brazil

GALHAS EM FOLHAS DE UMA MACRÓFITA AQUÁTICA, *Nymphoides indica* (Nymphaeaceae), no Vale do Rio Doce, Brasil

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RESUMO

Pela primeira vez, é registrada a ocorrência de uma galha de insetos em *Nymphoides indica* Ktze. (Nymphaeaceae) e um caso raro no qual galhas de insetos são encontradas em plantas aquáticas. A macrófita é amplamente distribuída nos inúmeros lagos do Vale do Rio Doce, Minas Gerais, Brasil. A galha esferóide é provavelmente causada por um Cecidomyiidae (Diptera) ainda não identificado. São fornecidos dados sobre a morfologia e abundância da galha na sua planta hospedeira.  
**Unitermos:** Galhas de insetos; Herbivoria; *Nymphoides indica*; Vale do Rio Doce.

ABSTRACT

For the first time, we report on an insect gall on *Nymphoides indica* Ktze. (Nymphaeaceae) and a rare case where a gall is described from an aquatic plant. The macrophyte is widely distributed in the several lakes of the Rio Doce Valley, Minas Gerais, Brazil. The spheroid gall is probably induced by an undescribed species of Cecidomyiidae (Diptera). We provide data on gall morphology and abundance on its host plant.  
**Keywords:** Herbivory; Insect galls; *Nymphoides indica*; Rio Doce Valley.
edge on the patterns of insect gall richness indicates that galls evolved primarily in water-stressed habitats (Fernandes 1992a). An important factor hampering gall colonization on plants in humid habitats is the high mortality rates exerted by pathogens (Fernandes 1992a). The occurrence of an insect gall on an aquatic plant makes this system very interesting to study in an attempt to unravel the rarity of galls on some habitat and plant groups.

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Figure 1: Leaf galls on *Nymphoides indica*. (not in scale).

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**Introduction**

Galls are found on most of the plant families throughout the world (Mani 1964, Fernandes 1992ab). Nevertheless, galls on aquatic plants have seldom being reported in the literature (see Docters Van Leeuwen-Reijnvaan & Docters van Leeuwen 1926, Houard 1933, Felt 1940, Mani 1964, Gagné 1989). This is the first report of an insect gall on *Nymphoides indica* Ktze. (Nymphaeaceae) and a rare case where a gall is described from an aquatic plant. The macrophyte is widely distributed in the several lakes of the Rio Doce Valley, Minas Gerais, Brazil (Ikusima & Gentil 1985).

The galls are spheroid, light green, glabrous, occur on both leaf surfaces and are coalescent in some instances (Fig. 1). Gall tissue is whitish, soft and juicy, probably due to its high water content in the gall and leaf tissue. No distinguishable larval chamber was found within the gall. Only one insect larva was found in 34 dissected galls. The larva was whitish, one millimeter long and belonged to the family Cecidomyiidae (Diptera). Despite of the wide occurrence of galls caused by the cecidomyiids in Brazil and especially in the Rio Doce Valley, studies should be performed to confirm the identity and role of the larva in this system. Cecidomyiids can be gallers, gall inquilines, as well as organisms that occupy the gall after the emergence of the galling herbivore (see Mani 1964).

Galls were not abundant. Twenty one out of 153 examined leaves of *Nymphoides indica* at Lagoa Caraíva were galled. There was an average of 41.8 galls per galled leaf (SD ± 49.1; n = 21). Gall diameter averaged 2.47 mm (SD ± 0.09 mm, n = 50). Galled leaves were frequently abscised. Nevertheless, many abscised leaves were also mined by an unidentified microlepidopteran larva.

The paucity of galls on some plant groups is not well understood and remains largely unknown (see Karny 1926, Fernandes 1992a,b). The question on why then are so few species of insect galls on aquatic plant is of vital importance to understand the evolution and adaptive nature of galls. Our present knowl-
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**Bibliography**


