



## Vivipary in *Hedychium elatum* (Zingiberaceae)

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### Abstract

Vivipary is a rare phenomenon in Zingiberaceae. In this article we report vivipary in the genus *Hedychium* for the first time.

Vivipary is the phenomenon of seed germination within fruit while still attached to the parent plant. Haberlandt (1898), Warming (1909), Cox & Humphries (1993) and Farnsworth (2000) have suggested that this phenomenon is an ecological adaptation that provides a means for dispersal, anchoring and establishment of the young plants under adverse environmental conditions and thus it is a convergent evolutionary feature. This was in contrary to the view of Guppy (1906) and Cridland (1964) who suggested that vivipary is a relic from the past when plants used to grow under swampy conditions in early geological periods (Shi *et al.* 2005). Viviparous germination is of rare occurrence in flowering plants: only around 143 genera and 195 species spanning 80 vascular plant families show vivipary, which amounts to less than 0.1% of the total number of angiosperms (Cota-Sánchez & Abreu 2007). Among monocotyledons, a few members of families like Asparagaceae, Liliaceae and Poaceae show vivipary, but, till date, there are few reports of viviparous germination in the family Zingiberaceae. Vegetative reproduction is relatively common in Zingiberaceae (as observed in species of *Alpinia* and *Globba*), which helps in spreading a number of propagules over a large area in a short period of time, but these individuals are all identical genetically. In vivipary, however, through germination of seeds on the mother plants, the offsprings produced are genetically diverse.

In this correspondence, we report the phenomenon of viviparous germination in *Hedychium elatum* Brown (1821: 526), which was observed by us in the wild. This, to the best of our knowledge, is the first report of viviparous germination in *Hedychium* (Zingiberaceae). *Hedychium elatum* plants grow abundantly in tropical and subtropical forests, generally in grassy or marshy areas and along the sides of streams in bright sunlight. But Sabu (2006) reported that *Hedychium elatum* plants grow on wet rocky surfaces as well. According to the Global Invasive Species Database (2005), some of the plants belonging to the genus *Hedychium* like *Hedychium gardnerianum* J. Sheppard ex Ker Gawler (1824: 774), *Hedychium coronarium* Koenig (1783: 73) and several others are vigorous weeds that often hinder the regeneration of other plants. *Hedychium gardnerianum* has also been placed among the “100 World’s Worst invaders” (GISD 2005). Gregarious growth and invasiveness seems to be a feature of some *Hedychium* species.

The authors report viviparous germination in *Hedychium elatum* plants growing on rocky substrate along waterfall at Lava (27°03'N; 88°23'E) during the monsoon season (July- August). Lava is situated 34 km east of Kalimpong, West Bengal, India, at an elevation of 6500 ft above sea level, adjacent to the Neora Valley National Park, India. Geographical and climatic conditions and other edaphic factors of the site are listed in Table 1.