

Bidens pilosa L.: Exclusive report of vivipary in a non-mangrove taxa from the eastern Himalayas

Narayan C. Karmakar¹ | Anjan Hazra² | Sauren Das² 

¹Department of Botany, Barasat Government College, Barasat, India

²Agricultural and Ecological Research Unit, Indian Statistical Institute, Kolkata, India

Correspondence

Sauren Das, Agricultural and Ecological Research Unit, Indian Statistical Institute, 203, B. T. Road, Kolkata 700108, India.
Email: sauren@isical.ac.in

Abstract

Vivipary is an extremely evolved type of epigeal germination in seed plants and very common in tropical estuarine plant communities (mangroves), ensuring a greater number of viable settings of offspring. In addition to this, there are some other non-mangrove angiosperm taxa that have a successful existence, and because of their invasive nature, vivipary has been reported as an attribute of their uncongenial abiotic stress. The present observation confirms the incidence of true vivipary in *Bidens pilosa* L. (a member of the family Asteraceae) from the eastern Himalayan region.

KEYWORDS

Asteraceae, *Bidens pilosa*, invasive, seed germination, vivipary

1 | INTRODUCTION

Vivipary is a rare occurrence in seed plants (Cota-Sánchez, 2004), and it is considered to be an adaptive feature of efficient survival of offspring in a hostile substrate. Being glided through stream to long distance, the viable seedlings proceed with instant advantage of maturity to some extent, prior to successful setting. In such a modified type of seed germination, embryo development is more or less uninterrupted and dispersal takes place through seedlings, not seeds. Immediately after fertilization, the embryo germinates and the germinating hypocotyl protrudes out of the seed coat, ultimately leading it to come out of the pericarp when the fruit is still attached to the mother plant. Before dispersal, the young seedlings reach maturity with plumule leaves at the distal end and a root system at the proximal end. True vivipary is considered to be a unique and advanced occurrence in the life cycle of some seed plants. The common occurrence of vivipary or modified vivipary (Cryptovivipary) can be noted in many mangrove taxa (Das, Ghose, & Paria, 2001). Callaghan and Emanuelsson (1985) opined that vivipary is an adaptive feature of disturbed habitat and reported that about 20% of the vascular plant taxa show vivipary in the Karsa Glacier of the Swedish Lapland

region. Incidence of abscisic acid (ABA) during seed dormancy was found to be comparatively lower in embryos of seeds of the viviparous mangroves (belonging to families such as Arecaceae, Myrsinaceae, Plumbaginaceae and Rhizophoraceae) and higher in those of non-mangroves belonging to the same families (Farnsworth, 2004). Thus, the above modified germination pattern is absolutely an adaptive characteristic. In the case of non-mangrove taxa, the incidence of vivipary is sporadic, but it has been reported from time to time (Table 1) and discussed in relation to their stress habitats.

Bidens pilosa L. (Asteraceae) is an invasive species with a wide distribution over different continents from its centre of origin in North America (Ballard, 1986). The species invaded and became widespread throughout the tropical and subtropical world. The name *Bidens pilosa* refers to two prominent teeth (i.e., barbed awns projecting from the apex of each fruit [achene]) and downy hairs on the stems and leaves. The cluster of mature barbed achenes on the capitular receptacle are dispersed through animals (zoochory). Therefore, the plant is considered to be an aggressive weed in the tropical and subtropical world. The plant has traditionally been used for food and medicines in ancient China. Either the whole plant or different parts of it have been reported to