SHORT COMMUNICATION

Oenothera laciniata Hill (Onagraceae): Addition to the Flora of North-western Plains

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Oenothera laciniata Hill was collected from wheat and brassica fields in Delhi during late winters of 2008-2011. The plants formed large rosettes with pinnatifid leaves on branches and set seed in early summer (April-May). Good establishment of plants was also noted in pot cultures. This species warrants attention for its potential for further spread as a weed of *rabi* crops in the Indian region.

Key Words: *Oenothera laciniata*, Punjab, Rosette, Weed

Oenothera laciniata Hill (Onagraceae) was collected from fields of the Indian Agricultural Research Institute (IARI), New Delhi (28º38'23" N, 77º09'27" E). This species was not earlier reported from Delhi (Maheshwari, 1963; Prithipalsingh, 2002). Its presence was recorded in the area of collection over a period of three years (2008-2010) where it formed conspicuous sparsely distributed rosettes (in fields of wheat and brassica), bearing pinnatifid leaves on the side branches. However, in other nearby areas (fields and road sides), the plants were absent indicative of restricted occurrence and no rapid spread. The species appeared in late winter and flowered and fruited in early summer.

Observations on the plants in the field, in transplants and pot cultures indicate that this species changes its habit in relation to moisture availability (Hilty, 2010) and achieves high seed production over a short growth season. These are characteristics of a successful invasive species but not of a noxious weed. Besides populations from Delhi, we have also located and examined specimens collected from fields of Punjab Agricultural University, Ludhiana. Furthermore, this species has been intercepted in wheat imports into India (http://www.plantquarantineindia.org/docfiles.Appendix-8.htm). *Oenothera laciniata*, therefore, is an important alien invasive species whose occurrence (Khan *et al*., 1984; Sasidharan, 2004) and spread must be monitored within the Indian region, taking into consideration, its wide global distribution and potential for spread as a crop contaminant (GRIN, 2009), its persistence in the 'soil seed bank' (Western Australian Herbarium, 1998-) and the high genetic diversity reported in the species (Ellstrand and Levin, 1982).

A brief taxonomic description along with useful ecological information is provided below. This information would enable research workers in plant genetic resources to identify this potentially invasive species and record its spread.

Oenothera laciniata Hill in Veg. Syst. 12 (app.): 64, t. 10. 1767 (Hort. Kew. 172 (4), t. 6. 1768); *Oenothera sinuata* Linn., Mant. Pl. 2: 228. 1771. Fig. 1A.

Diagnostic characters: Plants forming conspicuous rosettes; initial leaves oblanceolate, forming a basic rosette, cauline leaves smaller, distinctively pinnatifid, alternate, sessile; long calyx tube produced much beyond the ovary, reflexed calyx lobes subtending yellow petals which become pinkish-orange after pollination; pubescent ovary forming a long capsule, splitting from apex downwards; small, dark-brown seeds abundant in four locules (Fig. 1, A-D).

Flowering and Fruiting: April-May

Distribution: South America, Europe, South Africa, Iran, China, Taiwan, Korea, Japan (Wu Zheng-yi and P. H. Raven *et al.*, 1994; Amini and Habib, 2003). Within India in the north western plains [Bijnor, Uttar Pradesh (Khan *et al*., 1984); Delhi and Ludhiana, Punjab (RN & KP, 2008 to 2010)] and southern India [Idukki, Kerala (Sasidharan, 2004)].

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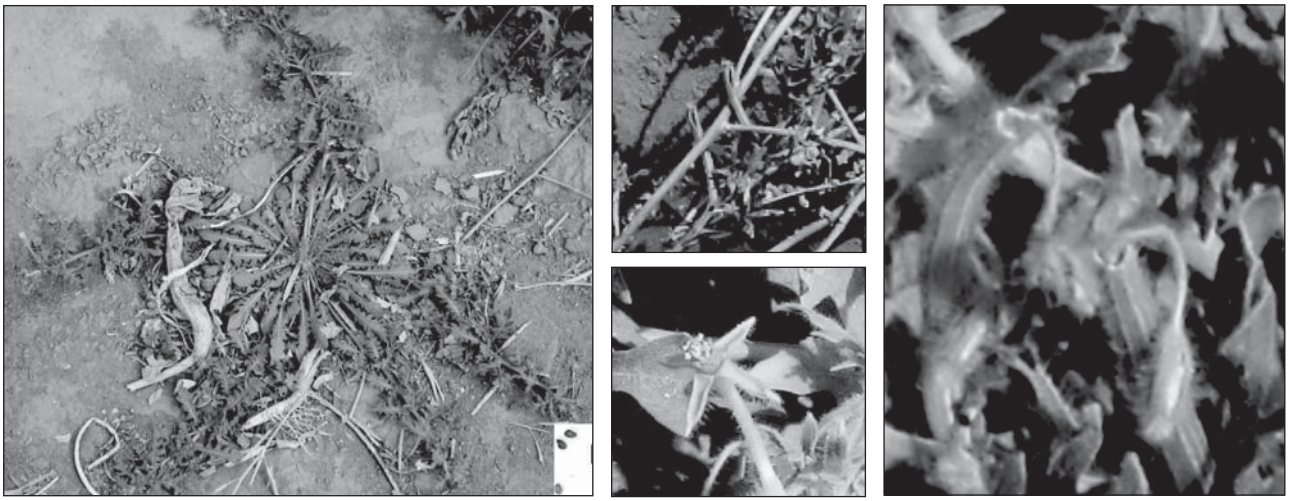

Fig. 1: *Oenothera laciniata*: (a) plant in the field; (b) close-up of flowers; (c) calyx and corolla drying up after pollination; (d) capsule splitting from apex downwards (seeds in inset, less than 0.2cm)

Origin: South eastern parts of North America (GRIN, 2009).

Habitat and Ecology: Weed found in wheat and brassica, restricted to a few adjacent fields, absent in others; fairly large populations recorded over consecutive years from 2008-2010, and co-occurring with some other rosette-forming species *viz*. *Tribulus terrestris* Linn. and *Coronopus didymus* (Linn.) Sm. and few common weeds such as *Amaranthus viridis* Linn., *Chenopodium album* Linn., *C. murale* Linn., *Heliotropium supinum* Linn., etc. in loose-textured sandy-clayey soil. Ploughing leads to elimination of plants unlike most other co-occurring weeds.

Seedling establishment high in pot cultures; plants raised from seeds flowered and set seed in similar season as in the field. Erect habit and occasional branching noted in pot culture, unlike its decumbent rosette-forming habit in field conditions.

Specimens Examined: INDIA, Delhi, IARI: 9 May 2008, RN/2008/HS19687 (NHCP); INDIA, Delhi, NBPGR: 13 April 2010, RN/2010/HS20239 (NHCP); INDIA, Delhi, IARI: 17 May 2008, RN/2008/HS20240 (NHCP); Ludhiana, Punjab: 18 May 2010, KP/2010/HS20249 (NHCP); USA, Florida, 3 April, 1987, L. C. Anderson, 10338 (http://www.herbarium.bio.fsu.edu/view-specimen.php?RecordID=9784); USA, Texas, H. Cliff 343, Bexar Herbarium, NPSOT San Antonio Chapter).

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