

OBSERVATIONS ON PESTS AND DISEASES OF WILD CICER SPECIES

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ABSTRACT

Preliminary observations of the occurrence of pests and diseases on wild *Cicer* species in Turkey, Ethiopia and Afghanistan are reported for the first time. Lepidopteran borers and bruchids appear to be the most serious pests. In most natural habitats, grazing by domestic animals is an important source of damage.

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India, has the international mandate for the improvement of the chickpea (*Cicer arietinum* L.) The germplasm collection at ICRISAT for *Cicer arietinum* now numbers about 12,000 accessions and forms a dynamic base for the breeding program initiated in 1973.

Several wild species of *Cicer*, which may have potential for future interspecific hybridization programs, were recently added to this collection. Most previous attempts of hybridization between wild and cultivated chickpeas were unsuccessful. Intensive crossing efforts are now being made. Ladizinsky and Adler (1976) reported the first successes in this field. At ICRISAT, crosses between *C. arietinum* and *C. reticulatum* Ladiz. were also successful and blight (*Ascochyta rabiei* (Pass.) Labr.) resistance has been transmitted to the cultivated species.

Most of the wild annual species, and the majority of the perennial species, closely related to the chickpea have hitherto been unavailable to plant breeders (van der Maesen, 1972). Desirable agronomic characters present in wild chickpeas include more seeds per pod, several pods per peduncle, various desirable growth habits, and drought resistance. Susceptibility of the wild species to most pests and diseases has not yet been evaluated, mainly because of the scarcity of seed supply and difficulty in growing

these species under cultivation, ICRISAT is working to overcome most of these constraints. Meanwhile the following annotated list of pests and diseases occurring on wild *Cicer* species *in situ* in Turkey, Afghanistan and Ethiopia may be useful. The observations were taken in the course of germplasm explorations during 1975 and 1976.

OBSERVATIONS

Annual species :

- 1, *Cicer bijugum* K.H. Rech. (van der Maesen JM 2103, 2113, near Savur and Ergani, Turkey). Very slight leaf miner attack. Cattle grazing quite severe. The very rough seed coat of this species may account for the lack of Bruchid attack.
- 2, *Cicer chorassanicum* (Bunge) M. Pop. (JM 2031, 2204, 2210, 2226, 2230, prov. Bamyan, Afghanistan). Occasional boring on pods, by Lepidoptera, pods only 10 mm long. In one case, some mildew and rust was observed on the leaflets. No Bruchid damage seen; seeds very small.
- 3, *Cicer cuneatum* Hochst, ex-Rich, (Seegeler 157, near Aksum, Ethiopia), Round blackish spots resembling *Ascochyta* blight on the pods. Seeds not affected. At ICRISAT, this species proved susceptible to blight. No Bruchid damage seen; seeds very small.
- 4, *Cicer echinospermum* P.H. Davis (JM 2133, near Solhan, Turkey). Very low *Liriomyza* incidence; leaf dodder (*Cuscuta* sp.), cattle grazing. Seed coat spiny-echinous, very rough; no Bruchids seen.
- 5, *Cicer reticulatum* Ladizinsky (JM 2100, 2105, 2106a near Savur, Turkey). Leaf miner, *Liriomyza cicerina* (Rond) and Lepidopteran larvae (not *Heliothis*) were defoliating and pod boring, but at a low incidence. No Bruchids were observed; seed coat reticulate, rough.
- 6, *Cicer pinnatifidum* Jaub, et Sp. (JM 2054, Ciftehan, JM 2123, Harput, Turkey). No pests or diseases observed.
- 7, *Cicer yamashitae* Kitam. (JM 2021a, 2022a, 2023, 2024, near Sarobi, Afghanistan). Some pods were produced almost subterranean, in the axils of the cotyledons and lower leaves, and were hidden between the rubble stones (normal habitat). These pods were attacked by Lepidopteran podborers to a lower degree than the aerial pods. Incidence was generally low.

8. The cultivated species, *Cicer arietnum* L, from Fevzipasa area, Turkey, had some *Liriomyza cicerina* damage, From stored chickpeas in Erzurum, Turkey, *Acanthoscelides obtectus* is a new record as a storage pest on this crop. *Bruchus pisorum* L., a common pulse beetle, was identified as one of the pests of stored chickpea seeds in Afghanistan,

Perennial species :

1. *Cicer acanthophyllum* Boriss. (Podlech 12934, Anjuman, Afghanistan), *Bruchus* sp. present; were found dead on herbarium specimens.
2. *Cicer anatolicum* Alef. (JM 2243, 2253, 2268, Tatvan to Van, Horasan to Pasinler and Beynam Forest, Turkey). A few *Aphis craccivora* and *Liriomyza cicerina*. Black thrips were seen on the stems (Tatvan).
3. *Cicer floribundum* Fenzl. (JM 2058, 2068, road from Osmaniye to Yarpuz, Turkey). A Coleopteran pupa (probably *Subcoccinella* sp.) found on this species was perhaps a predator.
4. *Cicer oxyodon* Boiss. et Hoh. (Bornmuller 6635, Lur, Iran). Some dead *Bruchus* sp. were found on herbarium specimen.
5. *Cicer pungens* Boiss. (JM 2182, 2205, 2212, 2224, 2236, 2238, prov. Bamyán and Maydan, Afghanistan). In some cases, the plants were heavily infested with Lepidopteran podborers and Bruchids, and no seed could be taken. A new species was found on *Cicer pungens*: *Bruchus* sp. aff. *pavlovskyi* Luk. & T.M. (determination: Mr. B. Southgate, Slough, U.K.). Other plants were completely free. Attacked pods remain on the plant, normally they shatter. Some leaf miner (*Liriomyza cicerina*) incidence. A saprophytic *Mucor* sp. was seen once. Occasionally dodder (*Cuscuta* sp.) was found on the plants.
6. *Cicer rechingeri* Podlech (JM 2214, near Panjao, Afghanistan). Lepidopteran larvae and Bruchid incidence was locally heavy. In some plants all pods were empty, other plants had escaped attack in the same location, possibly by flowering slightly later. Some Spidermite webs were seen, but the plants showed little damage.

Distribution of seeds and predators :

Most species, except *Cicer bijugum*, *C. echinospermum* and the closely related *C. reticulatum*, scatter their seeds. Pod valves are found shed near the plants but the seeds are ejected up to distances of one meter or more. Since the plants grow (or survive only) mostly on rubble slopes, the seeds thus escape birds and rodents.

Further damage :

Most *Cicer* species, annual and perennial, are grazed. Sheep and goats in particular decimate the entire flora, and take their share of *Cicer* species. However, because of its spiny leaf rachis, *C. pungen*s generally escapes heavy grazing before its pods have shattered. *C. chorassanicum* often has purple-coloured leaves, and in reddish or brown rubble such plants apparently are not so conspicuous to the goats. Birds sometimes eat young developing seeds from the pod (*C. yamashitae*, *C. chorassanicum*).

Exudation of the glandular hairs on the leaves of *C. rechingeri* is strongly acidic, and discourages goats; only once was grazing observed. The acid exudation of the glandular hairs of most species may also reduce the number of insect pests. This observation is being investigated further at ICRISAT.

Use by man:

People in many places recognize the similarity between wild and cultivated chickpeas. In Afghanistan the vernacular name for *C. pungen*s and *C. rechingeri* is similar (nachutak) to the name for chickpea (nachut). Young seeds are occasionally eaten. In Ethiopia, *C. cuneatum* is called the rat's chickpea (van der Maesen, 1972). When asked in Turkey for wild chickpea (yabani nohut) or forest chickpea (ormanli nohut), people were also able to point out growing places. Young seeds are not systematically collected, but are eaten now and then by shepherds and farmers. Similarly, the *C. microphyllum* Benth. of northern India is known as jungle chickpea and is eaten occasionally. The dispersal and population size of the relatively large-seeded *Cicer* spp. is reduced because of the reasons mentioned.

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