Branched Broomrape (*Orobanche ramosa*) in Texas

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ABSTRACT

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Orobanche ramosa (Orobanchaceae), a serious pathogen of tobacco, tomato, potato, eggplant, and some other crops in the Middle East, was discovered in Karnes County, TX, in February 1981. Ten genera of weed species in eight dicot families, among them families of agronomic importance, were documented as hosts.

The genus *Orobanche* (broomrape) includes some of the most important root parasites of agronomic crops. The most damaging are *O. aegyptiaca, O. cernua, O. crenata,* and *O. ramosa*. Of these, only *O. ramosa* L. (Fig. 1) has been introduced into the United States. It was reported in the late 1800s as a serious pathogen of hemp in Kentucky. In 1928 it was discovered in California, where it is still a problem on tomatoes (1). Other infestations were reported on coleus on Long Island, NY, and on tomatoes in New Jersey (1), but these infestations were destroyed. The California population remained as the only known population of agronomically important *Orobanche* in the country. We report a new population in central Texas.

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On 22 February 1981, K. Nixon and M. Johnston of the University of Texas discovered a broomrape just emerging from the soil on the east side of Texas highway 123 at the bridge over the San Antonio River in Karnes County, TX. After the plant was positively identified as *O. ramosa* by T. Collins of Evangel College, we revisited the site on 12 April.

O. ramosa was growing on a steep right-of-way between a fallow field on the east and a cornfield on the west. The largest number of plants was on the west side, where they began growing about 10 m from the bridge and extended 40 m south. On the east side of the bridge, they extended about 200 m north. The soil was circumneutral to basic. No attempt was made to count the number of parasites, although the population was estimated at more than 1,000 individuals. The vegetation was characteristic of roadsides

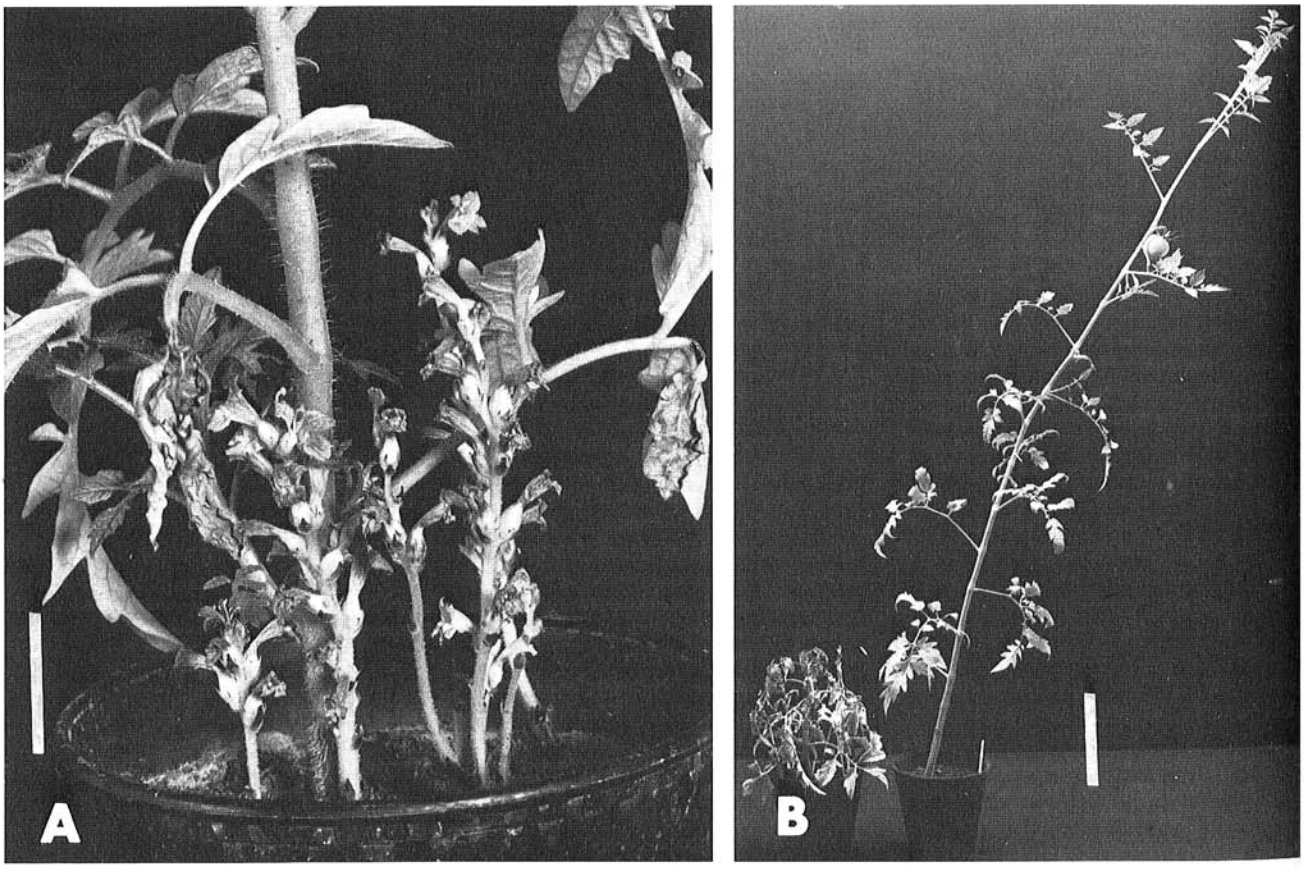

Fig. 1. (A) *Orobanche ramosa* on tomato. Scale = 2 cm. **(B)** Tomato plant on left infected by *O. ramosa*; uninfected plant on right. Scale = 10 cm. (Courtesy Weed Research Organization, Oxford, England)

of the region, with many perennial composites, other forbs, and numerous grasses.

Careful excavations verified the following as hosts: *Gaura brachycarpa* Small (Onagraceae), *Melilotus indicus* (L.) All. (Fabaceae), *Silene antirrhina* L. (Caryophyllaceae), *Callirhoë leiocarpa* Martin (Malvaceae), *Geranium texanum* (Trel.) Heller (Geraniaceae), *Chaerophyllum tainturieri* Hook. (Apiaceae), *Verbena* sp. (Verbenaceae), *Coreopsis basalis* (Otto and Dietr.) Blake, *Erigeron geiseri* Shinners, and *Engelmannia pinnatifida* Nutt. (all Asteraceae). Direct haustorial attachment was the criterion for the host determination. Voucher specimens were deposited in the herbarium of the University of Texas at Austin. *Engelmannia* was the most frequent host. Several monocots, including *Tradescantia* sp. (Commelinaceae) and various grasses, were excavated; however, no attachments were found.

Parasite height varied considerably, depending on host species. Parasites on *Geranium* were smallest (3 cm); those on *Engelmannia* were largest (up to 10 cm). The flowers of *O. ramosa* were up to 12 mm long and were crowded on a spike (Fig. 1). Unlike many of the plants of the same species in the Middle East, which have blue corollas, the Texas plants had white corollas. Conspicuous nectaries were present at the base of the filaments. This species appears to have autogamous flowers, ensuring a high percentage of seed set (2). The Karnes County population had produced capsules, many of which had opened and released the dustlike seeds by 12 April.

The broad host range indicates that this strain of the parasite may be able to attack crop species. It should be tested against commercially important crops, especially tomato and tobacco, if other populations are found in central Texas. Plant pathologists and weed scientists should be aware of the constant threat of introduction of *O. ramosa,* which is known to occur in Mexico and Cuba (1).

This case and the recent discovery of *Striga gesnerioides* in Florida indicate that field botanists need not only to be acquainted with major taxa of parasitic weeds but also to communicate significant finds to federal and state regulatory agencies. Without this communication, effective control measures cannot be initiated.

LITERATURE CITED

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