

COWPEA WITCHWEED, STRIGA GESNERIOIDES, A NEWLY DISCOVERED
ROOT-PARASITIC WEED INTRODUCED IN FLORIDA

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The Division of Plant Industry was informed by United States Department of Agriculture personnel on 23 January 1979 of positive identification of specimens of Striga gesnerioides (Willd.) Vatke, collected in October 1978 near Bartow in Polk County. The site was around old phosphate mining areas and was highly disturbed with a variety of weeds. The plants were parasitizing roots of hairy indigo, Indigofera hirsuta L., and alyce clover, Alysicarpus vaginalis (L.) DC. Three subsequent locations were reported in southwest Orange, southeast Lake, and northwest Osceola counties.

Cowpea witchweed is a small (3-18 inches tall), erect, annual, parasitic plant on the roots of various plants. It has small scale-like leaves, green in the summer and turning black in winter, contrasting with the brown, tan, or green of other plant material. Flowers are reddish to purplish or white. Seeds are extremely small.



Fig. 1. Striga gesnerioides flowering specimens parasitizing cowpea in Africa (courtesy USDA)



Fig. 2. Striga gesnerioides dead specimens in winter, parasitic on Indigofera hirsuta in Florida (photo E. M. Collins)

DESCRIPTION: Striga gesnerioides (Willd.) Vatke (figs. 1,2) (synonym: S. orobanchoides Benth.): A rigid, erect, annual, root-parasitic herb 0.75-5 dm (3-18 inches) high, usually much branched from the base, more or less covered with short hairs or almost glabrous; root tuberous, branches usually stout, angular, erect. Leaves scale-like, opposite or alternate, lanceolate, up to about 13 mm long, acute. Spikes terminal, often as long as the branches themselves, usually much interrupted, but sometimes rather densely-flowered and scarcely interrupted; flowers opposite to alternate,

sessile; bracts lanceolate to broadly lanceolate, about 6 mm long, 1.5-2 mm broad, acuminate, keeled, nearly glabrous or more or less pilose and ciliate; bracteoles linear about 4 mm long. Calyx 7-13 mm long, somewhat scarious, short hairy or glabrous except the teeth, more or less irregularly 5-toothed, 5-nerved, splitting very easily between the teeth; teeth lanceolate, acuminate, about 2 mm long, ciliate. Corolla brownish red, rose, lavender, to purple, or white; tube 9-13 mm long, bent and inflated above the calyx, glabrous or minutely puberulous; limb 2-lipped; upper lip shortly 2-lobed; lower lip deeply 3-lobed, lobes ovate, 3-5.5 mm long, 2.5-5 mm broad, entire or slightly toothed at the apex, thin. Style about 4 mm long, persistent. Capsule ovoid-oblong, 4.5-6 mm long, 2-3 mm broad, seeds very numerous (50,000-500,000 per plant), 0.25-0.4 mm long, thick, oblong, with heavy reticulations running more or less diagonally, giving a twisted appearance; seeds sparkle with colored highlights under high magnification.

Parasitic mostly on plants in the family Leguminosae, but also on some members of Acanthaceae, Burseraceae, Convolvulaceae, Euphorbiaceae, Geraniaceae, Liliaceae, Solanaceae, Vitaceae, and probably others. Native to Africa and India, newly established in Florida.

HOSTS: Hosts listed in various literature are: Alysicarpus vaginalis (L.) DC., Arachis hypogaea L., Balsamea sp. (=Commiphora sp.), Cissus quadrangula L., Dalbergia sp., Euphorbia abyssinica J. F. Gmel., Indigofera sp. (I. hirsuta L. in Florida), Ipomoea filicaulis Blume, Jacquemontia tamnifolia Griseb., Lepidogathis sp., Merremia tridentata (L.) Hallier f., Monsonia angustifolia E. Mey., Nicotiana tabacum L., rushes (Cyperaceae or Juncaceae?), Sansevieria sp., Tephrosia pedicillata Baker, Vigna unguiculata (L.) Walp. There appear to be different strains or races of S. gesnerioides, each parasitizing one or a few hosts, so that a particular population probably would not attack all plants on the host list. Alysicarpus vaginalis and Indigofera hirsuta are the only hosts definitely established at present for the Florida population of S. gesnerioides.

DISCUSSION: Striga gesnerioides is often called cowpea witchweed (the preferred vernacular name). It is also sometimes called tobacco witchweed or cowpea striga. The very small seeds may be wind-dispersed, at least for short distances. Surveys are being conducted to determine the extent of the current infestation. Yield reductions of 50% were reported in Africa for cowpea infested with cowpea witchweed.

CONTROL: Control measures have yet to be worked out, but will probably involve one or a combination of the following: trap cropping, herbicides, cultivation, fumigation, or seed germination stimulators. Seeds are reported to remain dormant and viable in the soil for up to 20 years. These seeds normally germinate only when stimulated by chemicals released by host roots. Certain plants, such as the nonhost bambara, Voandzeia subterranea Thou., can stimulate germination of cowpea witchweed seed without supporting growth. Also some plants which are hosts of one strain of cowpea witchweed can stimulate germination of seeds of another strain incapable of reproducing on this host. Much research remains to be done in this area.

SELECTED REFERENCES:

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- Thiselton-Dyer, W. T. 1906. *Flora of Tropical Africa*. 4(2):402-403. Reeve, Ashford, Enqland.