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Spanish Needles (*Bidens pilosa* L.) as a Wild Food Resource¹

JULIA F. MORTON²

Spanish needles (Bidens pilosa L.) is a common and pestiferous weed in nearly all tropical and subtropical areas. While it is primarily regarded as a subject for eradication, it has usefulness as a cover crop and fodder and source of nectar for honeybees. It is employed to some extent in native medicine and as food. Culinary trials of B. pilosa var. radiata in South Florida indicate that the young shoots of this and other varieties might well be more widely eaten as cooked greens.

A prominent member of the Compositae, *Bidens pilosa* L. (Fig. 1), is known by many vernacular names including Spanish needles, shepherds needles, beggarticks, sticktight, black jack, black fellows, railway daisy, acetilla and mozote. It is native to tropical America but widely naturalized and, in nearly all subtropical and tropical areas (30), ranks as the most common and conspicuous weed (11) and also as one of the most pestiferous.

It is an erect, branching herb, 2 to 5 feet high, with quadrangular, minutely hairy, stems. The leaves are opposite, toothed; 1½ to 3 inches long; simple and ovate, or compound with three to five, or even seven, lanceolate leaflets. The heads of deep-yellow disk florets may be rayless or encircled by five to eight white rays providing a diameter of ¾ to 1 inch and the pleasant aspect of daisies; but the continuous, year-around blooms are followed by the hated, needle-like, black achenes, ¼ to ½ inch long, tipped with two to five barbed awns which adhere to animal fur and clothing. E. E. Sherff (33) describes nine forms and varieties of *B. pilosa*, some always, some occasionally, rayless. The seeds germinate readily. There may be four or five generations within a year. Each plant bears 80 to 100 flower heads with a potential production of 3,000 plants in a single generation (30).

Most of the literature concerning *Bidens pilosa* is devoted to its eradication, chemi-

cally and otherwise (24, 27, 30). L. H. Bailey's statement that it is sometimes grown in botanic gardens (2) seems anticlimactic. Where this species occurs profusely in plantations of low-growing, smotherable crops, such as pineapple or young sugarcane, control is necessary (11). In fruit-tree orchards or groves, while it is never deliberately planted, it may be allowed to remain as a cover crop (Fig. 2), subject to mowing as green manure and having the advantage of decaying rapidly (14, 32).

Like its northern counterpart, *B. bipinnata* L., with which it shares the first two of the common names cited, it has value as a source of nectar for honeybees (23, 27, 38). It is also useful as fodder (7, 28, 41). Cattle are not partial to it in grazing (11) but consume it cut as feed (40). W. L. Barnett says it is "greedily eaten by horses and acts as a pick-me-up for horses off condition" (3). DeWildeman* recommended this forage especially for horses with intestinal parasites (33). The mature plants are apparently slightly purgative (3). Fresh plants placed in chicken pens are quickly stripped of leaves and flowers and are preferred by the poultry to other greens. Rabbit-keepers feed the young growth to their caged animals.

Medicinal Uses

Three North American species of *Bidens*, *B. bipinnata* L., *B. frondosa* L., and *B. connata* Muhl., are featured in King's American Eclectic Dispensatory (1855). Similarly, *B. pilosa*, though included as official in the Dutch Colonial Pharmacopoeia (6) only by confusion with another plant (7),

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*Pl. Util. Inter. 556-557. 1903; from footnote in Sherff, *The Genus Bidens*, p. 420.

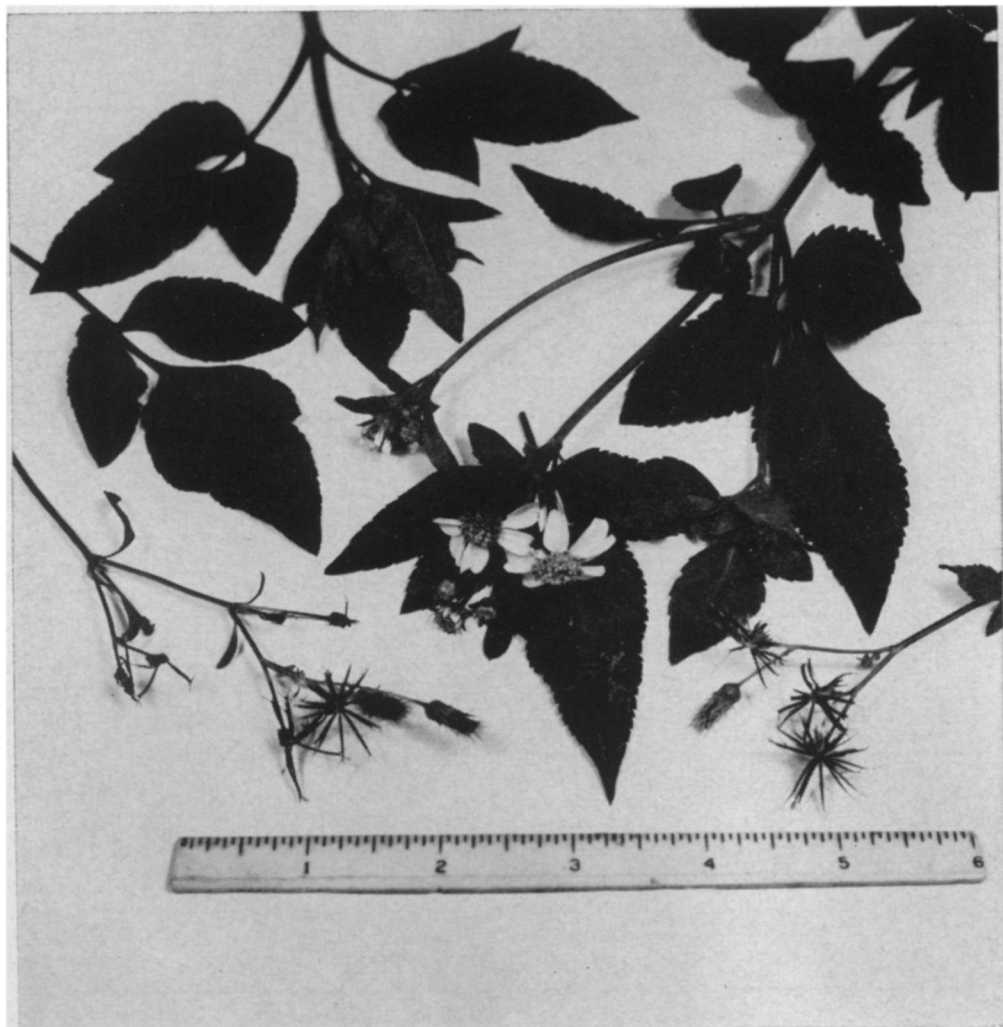


Fig 1. Spanish needles (*Bidens pilosa* var. *radiata* Schz. Bip. (syn. *B. leucantha* Willd.) has opposite leaves which may be simple or compound with 3 to 7 divisions. The annoying, needle-like achenes, tipped with barbed awns, stick to animal fur and clothing.

is resorted to in folk medicine wherever it grows. The heated or crushed leaves are applied as a poultice on wounds and boils (7). The warmed juice is dropped in the ear for earache and is said to act as a styptic, halting the flow of blood from a cut (10, 12). The leaf juice, with or without alum or lime juice, is used in treating eye complaints, as is an infusion of the root. For toothache, the leaves are rubbed on the gums, or a tincture of the flower heads is applied. An infusion of the plant is taken

for coughs and colic (39) and the juice as an antidote for poison (7). In abdominal distress, the powdered leaves are employed in enemas while the burnt seeds are rubbed into external incisions (39). The flowers are believed to allay diarrhea, and chewing the shoots or drinking a decoction of the leaves is thought to relieve rheumatism (39) and angina (31). In Florida, some take an infusion for arthritis. In Mexico, the plant was recorded as a curative agent even before mention by Xímenes in 1615; it was included



Fig. 2. At the U.S.D.A. Plant Introduction Station, Miami, Spanish needles serve as an uninvited but effective cover crop in a block of young mango and avocado trees.

in *Materia Médica Mexicana* in 1832 and has been discussed in numerous other reports on Mexican medicinal plants. It was long regarded as diuretic and antidiabetic (20). However, Guerra and Goyos concluded that it had an insignificant effect on the blood sugar level (16). Martínez states that it is nontoxic (20) to humans and this would certainly seem true of the young growth despite the findings of Heal *et al.* (17) that extracts of the plant are toxic to certain insects and larvae.

Food Uses

I became interested in the edibility of the new shoots of *Bidens pilosa* var. *radiata* Schz. Bip. (syn. *B. leucantha* Willd.) while compiling data on the edible wild plants of south Florida. The great abundance of this plant in vacant fields and on cultivated land, not only here but through much of the West Indies, Central America, Mexico and northern South America (33), and the equally common occurrence of the rayless var. *minor* and other forms in the tropics of the Old

World, are important factors in an appraisal of these plants as potential wild food resources. The alimentary usefulness of Spanish needles has apparently been widely neglected. Botanists have noted that Indians in Mexico boiled the young leaves of *B. pilosa* var. *bimucronata* O. E. Schulz and its form *odorata* and ate them with *pinole* (ground *Atriplex* seeds) and salt (33). Allusions to the use of *B. pilosa* var. *radiata* as a substitute for tea in Mexico are the result of confusion with *B. aurea* Sherff (syn. *B. tetragona* DC), which is known in Mexico as "té de milpa" or "manzanillo" and is the actual source of the brew served in addition to camomile tea and true tea in authentic Mexican restaurants today (29). According to F. B. H. Brown (4), *B. pilosa* is used as a tea substitute in the Marquesas, a practice acquired from the Chinese. The Indians in Texas made a tea of the flowering tops of *B. bigelovii* A. Gray (43).

Ochse (22) describes and discusses both *B. pilosa* and *B. chinensis* Willd. (better known as *B. biternata* Merr. & Sherff), stating that the "young apical shoots" are sold as vegetable greens in native markets in Java and "furnish a much relished 'alab,' which is eaten raw and steamed." In the Philippines, the flowers (7) or leaves of one or the other of these two species are mixed with half-boiled rice before fermentation in the making of the Igorot wine called "sinitsit" (5, 6, 7). In Nyasaland, the young shoots and the leaves of older plants are commonly cooked and eaten throughout the year even though the "aromatic taste is not much liked," and the leaves are often dried for use during droughts. Sometimes the greens are cooked with peanuts or tomatoes or bits of the very bitter leaves of *B. schimperi* Schz. Bip. (42).

There is scant additional mention of the alimentary use of *B. pilosa* or other species, apart from a brief comment by Dalziel (10) that "The young leaves can be used as a pot-herb." Fernald and Kinsey (13) cite Dalziel in a few disparaging lines captioned "Spanish needles, *Bidens bipinnata*," indiscriminately including *B. pilosa* by implication, but these respected authors contribute nothing more. Only Gillespie (15) manifests some acquaintance with the edibility of *B.*

bipinnata, commenting, "The young plants are parboiled, usually in mixture with other greens."

Culinary Trials in South Florida

In October, 1961, I gathered a small quantity of the new tips of *B. pilosa* var. *radiata* from plants growing along a sidewalk in Coral Gables, boiled them without salt, ate them unseasoned and was impressed by the retention of form, texture and color and the resinous, not unpleasant, flavor which seemed to make seasoning in cooking unnecessary and which, too, tended progressively to "condition" the mouth as do some hot pepper sauces.

In February, 1962, I clipped into plastic bags approximately two pounds of tender tops from plants in a vacant lot in a residential area, washed them, stored them overnight in the vegetable crisping tray of a home refrigerator, and the next morning found them fresh and crisp and attractively mint-like in appearance. Replaced in plastic bags, they were taken to the Home Economics laboratory on the North Campus of the University of Miami and, through the courtesy of Dr. Faye Grant, divided into two kettles, covered with water and boiled vigorously for 20 minutes—one batch with salt and one without. Separate portions of salted and unsalted greens were served to me, Dr. Grant, Mrs. Phyllis Murray of the Home Economics staff, and six students. The reaction of each was privately entered on a questionnaire form before any discussion with others present.

On May 18th, an hour was spent in leisurely and selectively gathering another two pounds of tops from plants tolerated as a cover crop in several acres of young mango and avocado trees at the U.S. Dept. Agric. Plant Introduction Station, Miami. The fresh material was washed and distributed in plastic bags to six volunteer samplers: three botanists and Dr. F. E. Henzlik, a noted educator-farmer from Nebraska, his wife and her sister. After 60 hours of refrigeration, some of the same harvest, showing no signs of wilting or breakdown of any kind (Fig. 3), was supplied to Mr. J. Arthur Lewis, formerly head of Food Technology at the University of Miami and presently



Fig. 3. The tips of Spanish needles, collected and refrigerated in plastic bags, show no wilting after 60 hours; are appetizingly mint-like in appearance.

Secretary of the Inter American Food Institute, Inc. All took the greens to their homes, where they were boiled for 20 minutes, with or without salt as they chose, and all recorded their evaluations independently on questionnaire forms provided.

In appearance, all samplers agreed that, both before and after cooking, the greens were attractive, inviting, suggesting "vitality" in form, texture and good green color. Cooking did not render them "limp," "soggy," "slimy" or "sleazy" and the leaves retained their "original bulk and individual identity." They were uniformly judged superior in this respect to spinach. Three of the Home Economics students objected to the tiny stems as detracting from appearance and would have preferred them trimmed. Most samplers referred to the cooked texture as firm but tender.

In regard to flavor, three of the students likened it to "pine" or "pine needles" and remarked unfavorably on the lingering after-taste. One noticed a "waxy coating in the mouth." To one student and to Mr. Lewis, there was a suggestion of mint. Bitterness was reported by five students, but not mentioned by other samplers. One student found the bitter resin accentuated in the salted greens. Dr. Grant, Mrs. Murray, Mr.

Lewis and I considered salt superfluous. The six students were, strangely, all partial to spinach and rated Spanish needles inferior but acceptable as greens; none would reject them. By all but two of the other samplers, whether fond of spinach or not, Spanish needles were rated as superior or equal in flavor.

The greens had distinctly greater appeal to the more sophisticated taste of the Home Economics teachers and the Food Technologist than to the students. Two of the botanists were unimpressed with the greens, rating them merely as "fair," but one reported that his young daughter enjoyed them without reservation and he attributed this to the fact that the entire family was accustomed to turnip and mustard greens and preferred their pungency to milder sorts.

Mr. Lewis found that a little butter on the hot greens enhanced the flavor slightly. Dr. Henzlik added salt and vinegar to the slightly cooled greens, as is his habit with spinach, and pronounced the Spanish needles superior. Dr. Grant and Mrs. Murray chopped left-over cooked greens and tried them as salad with vinegar, with French dressing and with Italian dressing containing garlic. They enjoyed them with the first two and even more so with the last. They were disappointed that the resinous character of the greens had dissipated somewhat while standing approximately three hours after cooking. Mrs. Henzlik and her sister, who have deplored the lack of variety in greens on the south Florida markets, approved the firmness of the cooked Spanish needles as salad material; they were not rendered "slimy" by dressing, and were declared "more attractive for this use than beet, dandelion or mustard greens." Both considered them excellent with French dressing and "a welcome change."

One botanist, Mrs. Lillian Fly, kept the plastic-contained greens in her refrigerator, but not in the vegetable crisper, for five days, found the leaves still fresh but the stalks showing a slight browning at the ends. The cooked greens, eaten hot, she found only slightly resinous, not at all unpleasant, "rather undistinguished; comparable to beet greens; inferior to spinach in flavor." She preferred the greens cold as a

salad with Italian or Roquefort dressing and was pleased with the absence of "mushiness."

I noted, in a similar trial, that after a week's refrigeration a few leaflets showed slight fading of color or brown speckling while the majority were still unblemished; when cooked, the greens were only faintly resinous in flavor but still of firm or "chewy" texture, whether eaten hot or cold.

Composition

The following constituents were reported by Barnett for *Bidens leucantha* in Jamaica (3): Martinez lists (as translated from the Spanish) "chlorophyll, essential oil wax, neutral fat liquid at 20°, a neutral resin and an acid, certain tannin, gallic acid, oxalic acid, another special acid, a neutral, non-nitrogenous substance, glucose, gummy and albuminous principles, potash, calcium, magnesium; phosphoric, sulphuric, carbonic and hydrochloric acids (20)."

No recent chemical analyses, nor assays of vitamin values, have come to hand. Spanish needles were not included in any of the studies of the nutritive values of Mexican, Central American and Cuban plants by Dr. Robert S. Harris and his co-workers. One may reasonably conclude that the popular status of *Bidens* species as medicinal herbs has caused these plants to be overlooked or ignored in the American tropics as likely foods.

Summary

Since there is a need for more green, leafy vegetables in the tropical American diet and the cultivation of such crops is beset with more than the usual difficulties in the

tropics and subtropics, the writer believes the superabundance of *Bidens pilosa* in its various forms may constitute a valuable wild food resource worthy of thorough investigation. The chief assets seem to be year-around availability, excellent keeping quality, attractive appearance and texture before and after cooking and one might suggest, too, a suitability for low-sodium diets. The resinous flavor and aftertaste, viewed negatively by some, favorably by others, are subject to modification by standing or storage, or enhancement by the evolving of acceptable recipes.

References

1. Arbelaez, E. P. *Plantas Utiles de Colombia*. 3rd ed. Bogotá. 1956.
2. Bailey, L. H. *Standard Cyclopedia of Horticulture*, Vol. I. New York, 1928 (reprinted 1947).
3. Barnett, W. L. *Grasses and Forage Crops of Jamaica*. Jour. Jamaica Agric. Soc. **40**: 16-26, 114-120. 1936.
4. Brown, F. B. H. *Flora of Southeastern Polynesia*. Bul. 130. Bernice P. Bishop Museum, Honolulu. 1935.
5. Brown, W. H. *Useful Plants of the Philippines*. Vol. III. Tech. Bul. 10. Dept. of Agric. and Commerce, Manila. 1946.
6. Brown, W. H. *Wild Food Plants of the Philippines*. Bul. 21. Dept. of Agric. and Nat. Res., Bur. of Forestry, Manila. 1920. Also bound in *Minor Products of Philippine Forests*. Vol. II. Bul. 22, Dept. of Agric. and Nat. Res., Manila. 1921.
7. Burkill, I. H. *A Dictionary of the Economic Products of the Malay Peninsula*. Vol. I. London. 1935.

TABLE 1
CONSTITUENTS OF *Bidens leucantha* (3)

	Dried at 100° C.	Sun dried	Green
Moisture	---	15.83	90.01
Fat	1.54	1.30	0.15
Albumenoids	10.91	9.19	1.09
Amides	0.91	0.76	0.09
Carbohydrates	33.56	28.24	3.36
Fibre	33.34	32.27	3.83
Ash	14.74	12.41	1.47
	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>
Potash	3.80		
Lime	1.64		
Phosphoric Acid	0.54		

8. Carneiro Ribeiro, J. H. Sobre um Inimigo do *Bidens pilosus*. *Agronomía* 12(2): 51-53. 1953.
9. Cook, O. F. and G. N. Collins. Economic Plants of Porto Rico. Vol. VIII, Pt. 2. Contrib. U.S. Nat'l. Herb., U.S. Nat'l. Mus., Smithsonian Inst., Washington, D. C. 1903.
10. Dalziel, J. M. Useful Plants of West Tropical Africa. London. 1948.
11. Degener, O. Flora Hawaiensis (New Illus. Flora of Haw. Isl.) Books 1-4. 2nd ed. New York. 1946.
12. DeWildeman, E. Sur des Plantes Médicinales ou Utiles du Mayumbe (Congo Belge). Mem. Inst. Royal Colonial Belge. Vol. VI, Fasc. 4, Brussels. 1938.
13. Fernald, M. L. and A. C. Kinsey. Edible Wild Plants of Eastern North America. New York. 1958.
14. Gaskins, M. H. Personal communication. May 14, 1962. Pl. Introd. Sta., Agric. Res. Serv., U.S. Dept. Agric., Miami, Fla.
15. Gillespie, W. H. A Compilation of the Edible Wild Plants of West Virginia. New York. 1959.
16. Guerra, F. and C. Goyos. Acción de la Aceitilla, *Bidens leucantha*, sobre la Glicemia Normal and la Hiperlglicemia Diabetica. La Prensa Médica Mexicana Vol. 16, pp. 7-11. 1951.
17. Jacobson, M. Insecticides from Plants: A Review of the Literature, 1941-1953. Agric. Handbook 154. U. S. Dept. of Agric., Washington, D. C. 1958.
18. Jepson, W. L. Manual of the Flowering Plants of California. Berkeley. 1925.
19. Ledin, R. B. The Compositae of South Florida. Quart. Jour. Florida Acad. Sci. 14(2-3): 51-207. June-Sept. 1951.
20. Martínez, M. Las Plantas Medicinales de Mexico. 4th ed. Mexico. 1959.
21. Muenschner, W. C. Weeds. 2nd ed. New York. 1955.
22. Ochse, J. J. and R. C. Bakhuizen van den Brink. Vegetables of the Dutch East Indies. Buitenzorg, Java. 1931.
23. Ordetx Ros, G. S. Flora Apícola de la América Tropical. Havana. 1952.
24. Paixao, J. da C. and R. Machado. Reação do picão (*Bidens pilosus* L.) a diversos herbicidas. Soc. Bot. do Brazil, Anais do IV Congresso Nacional. pp. 222-239. 1953.
25. Pittier, H. Ensayo Sobre las Plantas Usuales de Costa Rica. Washington, D. C. 1908.
26. Pittie, H. Manual de las Plantas Usuales de Venezuela. Caracas. 1926.
27. Pope, W. T. Manual of Wayside Plants of Hawaii. Honolulu. 1929.
28. Provision of Animal Fodder in Tropical and Subtropical Countries, The. Pt. I. Bull. 31. 1944 (reprinted 1949). Aberystwyth, Gt. Brit.
29. Rich, Clinton. Personal communication, Apr. 21, 1962. Mexico, D. F.
30. Rochecouste, E. and R. E. Vaughan. Weeds of Mauritius. No. 1. *Bidens pilosa* Linn. (Herbe Villebague). Leaflet No. 1, Mauritius Sugar Industry Research Inst., July, 1959.
31. Roig y Mesa, J. T. Plantas Medicinales, Aromaticas o Venenosas de Cuba. Havana, 1945.
32. Ruehle, G. D. Personal communication, Apr. 19, 1962. Univ. of Florida Subtr. Expt. Sta. Homestead, Fla.
33. Sherff, E. E. The genus *Bidens*. Pt. I, Pub. 388; Pt. II, Pub. 389. Field Museum of Nat. Hist., Chicago. 1937.
34. Standley, P. C. Flora of Costa Rica. Pub. 429. Bot. Ser. Vol. XVIII, Pt. IV. Field Museum of Nat. Hist., Chicago. 1938.
35. Standley, P. C. Flora of the Lancetilla Valley, Honduras. Pub. 283. Bot. Ser. Vol. X. Field Museum of Nat. Hist., Chicago. 1931.
36. Standley, P. C. Flora of the Panama Canal Zone. Vol. 27. Contrib. U.S. Nat'l Herb., U.S. Nat'l Museum, Smithsonian Inst., Washington, D. C. 1928.
37. Standley, P. C. Flora of Yucatan. Pub. 279, Bot. Ser. Vol. III, No. 3. Field Museum of Nat. Hist., Chicago. 1930.
38. Underhill, R. Spanish Needle Gives Way to Soybeans. Amer. Bee Jour. 98(2): 50. Feb. 1958.
39. Watt, J. M., and M. G. Breyer-Brandwijk. The Medicinal and Poisonous Plants of South Africa. Edinburgh. 1932.
40. Williams, R. O. Useful and Ornamental Plants in Zanzibar and Pemba. Zanzibar. 1949.
41. Williams, R. O. and R. O. Williams, Jr. Useful and Ornamental Plants of Trinidad and Tobago. 4th ed. Trinidad. 1951.
42. Williamson, J. Useful Plants of Nyasaland. Nyasaland. 1955.
43. Yanovsky, E. Food Plants of the North American Indians. Misc. Pub. 237. U.S. Dept. of Agric., Washington, D. C. 1936.