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An Invading Plant in Taiwan-*Mimosa pigra* L.

Yang Sheng-Zehn¹ Peng Ching-I²

【Abstract】 An invading species from the southern Taiwan, *Mimosa pigra* L., is reported in this article. The population of *M. pigra* has invaded the riverbank, harbor, flood plain, river embankment, trail, sedimentary land, etc, quickly in the southern Taiwan during the last three years. Keys to the *Mimosa* genus, taxonomical treatment, line drawing and a map showing its distribution on the island are provided.

【Key words】 noxious plant, invading plant, weed, *Mimosa pigra*, Mimosaceae, Taiwan.

臺灣入侵植物-刺軸含羞木

楊勝任¹ 彭鏡毅²

【摘要】 本文報導臺灣南部一種入侵植物-刺軸含羞木 (*Mimosa pigra* L.)。刺軸含羞木目前已蔓延於臺東縣，屏東縣與高雄市等地區之河床，路邊，港口淤積地，林道兩邊。本文提供含羞草屬三種的檢索表，以及刺軸含羞木植物繪圖、臺灣之分布位置圖與植物描述與建議。

【關鍵詞】 有毒植物、入侵植物、刺軸含羞木、含羞草科、分類、臺灣

I. Introduction

In recent years, the Flora of Taiwan has increased gradually because taxonomists have endeavored to make an inventory of works and found more new and new record species (Su, 1998). Of course ornamental or cultivated plants also make the species richness higher. Except ornamental uses and academia scientific researches, human serious development made habitat fragmentation and edge effects could supply better and wider spatial situation for population occupation. We firmly support the concern for biological inventory about shrub or

herb layer plants (van Steenis, 1967).

During 1996-1999, we made an inventory in Shouka logging track along the roadside of Pingtung county, southern Taiwan (Fig. 1) and found an unknown plant. Comparing the Flora of Java (Backer and Bakhuizen, 1963), the early records of the Northern territory (Miller and Lonsdale, 1987) and a description of the genus *Mimosa* L. (Mimosaceae) in the new world (Barneby, 1991), we considered this plant should be a new record species in Taiwan and its scientific name is *Mimosa pigra* (English name is "Giant Sensitive Plant").

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II. Results and discussion

The invading plant, *Mimosa pigra* L. has spread widely and quickly since it was found in 1997. In August 2nd, 1999, we made collections to look for this plant in the area of Shouka logging track. We were surprised that *Mimosa pigra* had become a strong invader covering a wide area on the beds of Ansuo river (Fig. 1) and roadside near the Ansuo river. We strongly suspected that it could be cultivated for the natural fertilizer, but people living there said that it has been naturalized for many years.

Mimosa pigra is a native of tropical Africa

and America, but now appearing in the southern Taiwan. It indicates that the species grows well in this region for many years and gradually adapts to the drier habitat. Lonsdale (1993) examined that the invasion of the wetlands of tropical Australia by the woody weed *M. pigra* and the fastest rate involved wind dispersal alone would be 18.3 m/year.

Lonsdale (1993) also indicated that there was a close correlation between the increase in the area colonized by the plant and the rainfall in the previous wet season. Although we really don't know when and how *M. pigra* was dispersed or

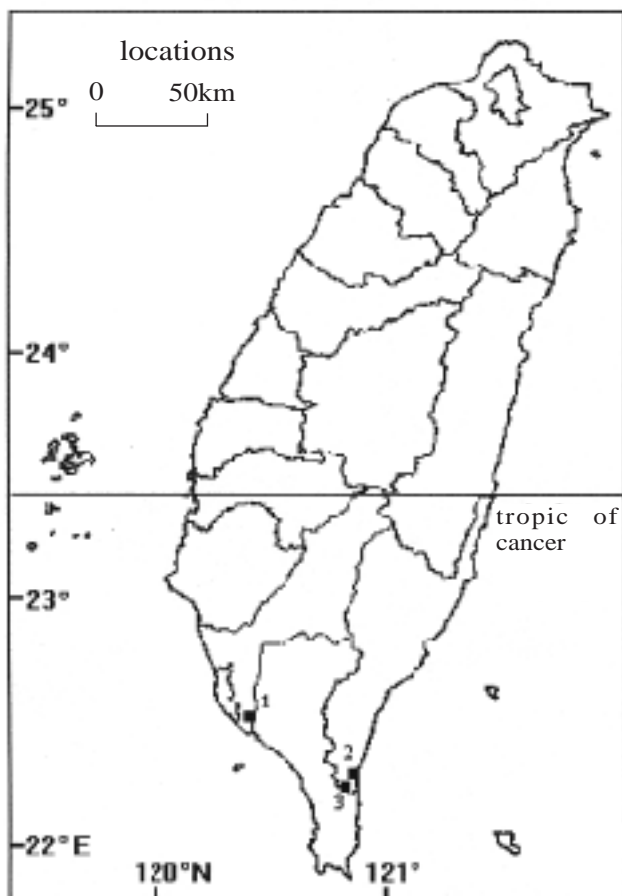


Fig. 1. Distribution of *Mimosa pigra* in Taiwan.
(1. Hsiaokang 2. Ansuo 3. Shouka)

introduced in Taiwan, we can be sure that there are 3 clumps found in Taitung, Pingtung, Kaohsiung county and Kaohsiung city. It is possible that the plant's invading rate will exceed 18.3 m/year due to the strong trade and monsoon wind influencing in Taiwan. We suggest that the vital ability of *M. pigra* will be stronger and will distribute wider, quicker and more abundance. These observations and conclusions can be proved because it's traced continuously on the roadside or riverbank of Shuang-liu (雙流) forest recreation area; in the sedimentary land of Hou-ching river (後勁溪), Yuan-chung harbor (援中港), Nan-tzu district (楠梓區), Kaohsiung city; in a sunny and waste place of Kaohfeng road (高鳳路), Hsiaokang (小港) district, east- Kaohsiung; in the wasteland of pakualiao (八卦寮), Jenwu Hsien (仁武鄉), Kaohsiung county. We may conclude that *M. pigra* was found in Taitung county firstly and gradually distributed into west land of Taiwan like Pingtung, Kaohsiung city and Kaohsiung county.

Mimosa pigra had been found in Hong Kong, growing in the wasteland at Tai Tung, near Three Fathoms Cove. It had replaced species-rich wetlands with impenetrable, monospecific shrublands. In Australia, it was considered the number one environment weed and the largest single threat to wetlands. The only effective method of control at the same time was intensive, repetitive treatment with herbicides, although 11 biological control organisms had already been released in Australia (Lonsdale, 1993).

Lonsdale and Abrecht (1989) emphasized that the most germination of *M. pigra* occurred at the start of the dry season and seedling survival was determined by the availability of soil

moisture. Quentin and Fuller (1995) suggested that this species would threaten the natural ecosystems. Lonsdale *et al.* (1985) found that the seeds of *M. pigra* were readily dispersed by water. Hence, there was a high probability that the plants in the pound were derived from seed produced upstream rather than the reverse. From the authors' opinions, the habitat of this plant is the wetland in the region of the river or stream.

The invading rate of *Mimosa pigra* was so rapid that it may naturalize and migrate into the southern regions by water, animals, topography and wind in the near future. We need to pay attention to its spreading abilities and competition with other plants because it will threaten the ecosystems. It is crucial that *M. pigra* had soon migrated into southern Taiwan. It will threaten the ecosystems of Taiwan more seriously than *Leucaena glauca* (L.) Benth., which was introduced for herbage utilization many years ago. Though it may be advantageous in soil and water conservation or for greenery, it can influence the growth of native plants and take possession of them seriously. It is already considered a noxious weed in tropical America and the Northern territory, so the control of this strong invader in the future is very important.

In summary, if we do not take care of the noxious weed developments instantly and let them invade anywhere unlimitedly in Taiwan, another *Leucaena glauca* catastrophe event will be happen very soon in the near future. We suggest that the Department of Government and academies should monitor *M. pigra* site for regeneration from the persistent bank or roadside. Vital rate, within- population dynamics (Schemske *et al.*, 1994), growth rate, spatial distribution, biological control methods, about *M.*

pigra are always available to pay attentions. The huge environment variation will be a catastrophe to plant persistence and survival if we still don't concern for the invading plants especially in the southern Taiwan.

III. Taxonomy

For the exhibiting of *Mimosa pigra*, the followings are detailed information, the description of the plant and a line-drawing (Fig. 2). All the collections are preserved in herbaria of PPI and HAST. Here are the key to *Mimosa* and *M. pigra* taxonomical treatment:

Key to the species of *Mimosa* in Taiwan

1. Erect shrub; pinnae 5-15-paired, 3-6 cm long
.....*M. pigra*
1. Scandent or decumbent shrub.
 2. Decumbent; pinnae 2-paired.....*M. pudica*
 2. Scandent shrub; pinnae 4-7-paired, 3-4 cm long.....*M. diplotricha*

Mimosa pigra L., Cent. Pl. 1: 13. 1755., Backer and Bakhuizen in Fl. of Java 1: 561. 1963; Quentin and Fuller in Plant invaders p. 91, f. 4.9. 1995; Nielsen in Fl. Malesiana 11: 185. 1992. 刺軸含羞木 (新擬) (註: 與刺軸含羞草係同種) (Fig. 2)

Mimosa asperata L., Syst. Nat. ed. 10: 1312. 1759; Lu *et al.* in Trees of Taiwan 1: 170. p. 170-171. 2000.

An erect and widely branched shrub forming riparian thickets, up to 1-5 m height; stems with 2 larger sharp recurved prickles and hairs. Leaves alternate, bipinnate, sensitive pinnae 5-15 pairs, 3-6 cm long; leaflets 18-51 pairs, linear to linear-oblong, apex acute, base obtuse, 4-11 mm long, 0.8-1.5 mm wide, parallel veins 3-5, margin with bristles, glabrous above,

finely pubescent beneath; stipules erect, nerves 7-10, ovate to lanceolate, 2-4.5 mm long, 1-2 mm wide, persistent; petiole 1-2 cm; main rachis with many prickles; 1-2 aculeate on each internode.

Heads 1-3 in the leaf-axils on the higher ones or all in a terminal raceme; peduncles 1.5-3.5 cm long, clothed with appressed acroscopic hairs with a thick base; calyx pappus-like; corolla gamopetalous; stamens as many as or twice as corolla-lobed, far exserted; filaments free, violet during anthesis, turning pale with age.

Pods 4-6 clustered per capitulum, 4-8 cm long, 1-1.2 cm wide, linear-oblong, flat, closely beset with rather long, rigid, but not sharp bristles, 10-25 articulates, splitting transversely into 1-seeded joints; sutures undivided, persistent; seeds elliptic-oblongate, 5-7 mm wide.

Distribution: Tropical South America, but now pantropical and spreading rapidly in tropical Asia like as Sumatra, Java, New Guinea (Nielsen 1992). Taiwan, in sunny and wetland area or low elevations of about 400 m.

Habitat and ecology: growing in dikes, water-sides, swampy localities, open waste places, roadsides and abandoned paddy fields. Flower, fruit throughout the year.

Specimen examined: *Yangsz* 27672 (fl., fr.) (PPI), Nov. 1997, Shouka logging track, Mutan; *Yangsz et al.* 28122, June 27th, 1999, Kaohfeng road, No. 116-12, Hsiaokang district, east-Kaohsiung; *Yangsz et al.* 28256, August 2th, 1999, Ansuo river, Taitung county; *Yangsz* 28896 (fr.), July 3th, 2000, the wasteland of Pakualiao, Jenwu Hsien, Kaohsiung county.

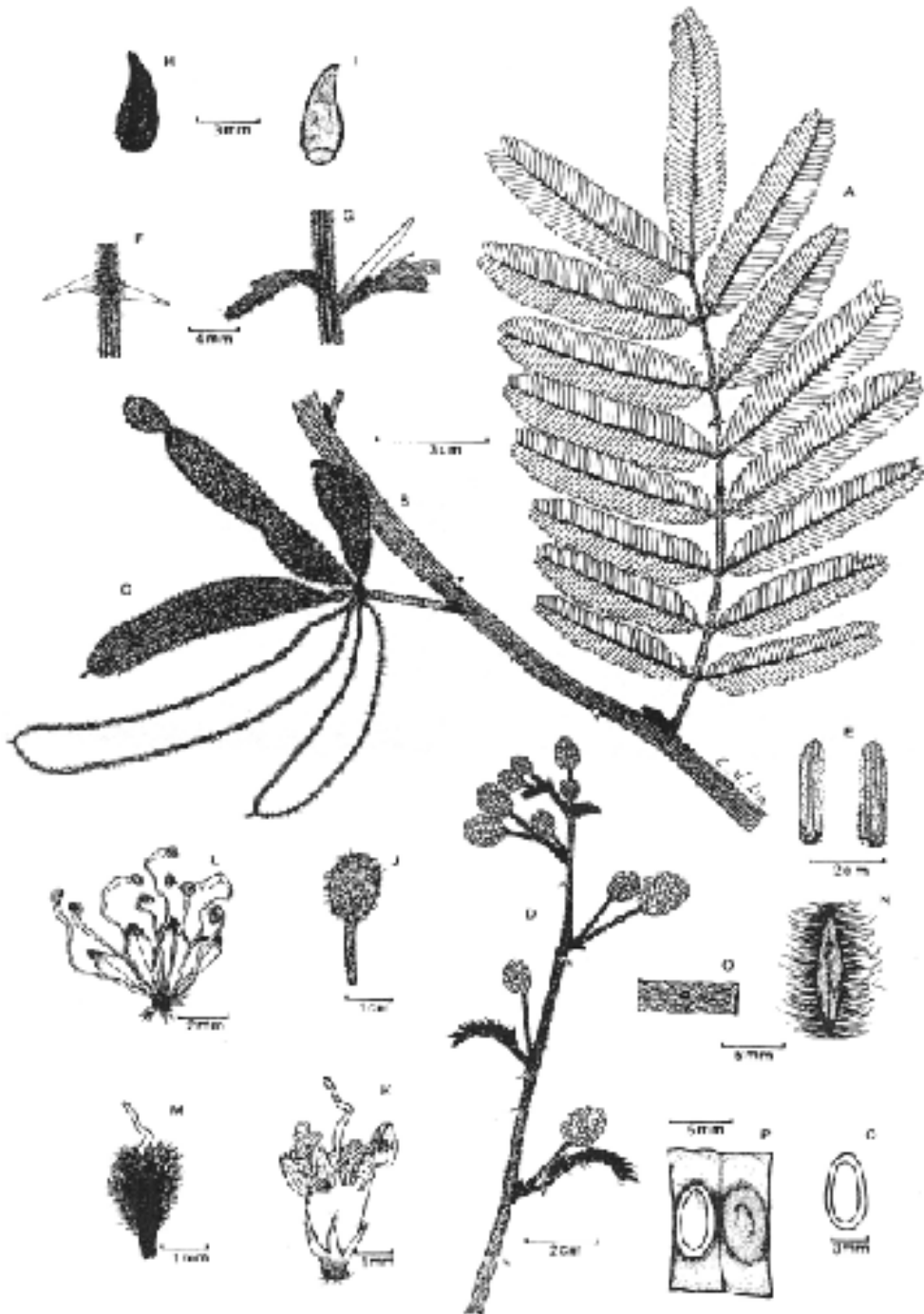


Fig. 2. *Mimosa pigra* L. (Mimosaceae)

A. bipinnate compound leaf B. a portion of stem with prickles C. pods 4-6-clustered D. branch with inflorescence E. leaflets F. prickly G. spine H. abaxial of stipule I. adaxial of stipule J. head K. flower L. corolla and stamen M. pistil with pubescent ovary N, O. an article of pods surfaces covered with bristles P. an article and its vestiture Q. seed.

IV. Acknowledgements

We greatly appreciate associate professor Cheng Zen-Chau who brought the specimen of *M. pigra* for identification. We also thank Lin Chi-Chung, Hsiao Chin-Chuan, Chan Shu-Hui, who went to Kaohsiung area to collect and Lin Cing-Hsin for line drawings.

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