

Fossil Polygonaceous Palynomorphs of Taiwan

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ABSTRACT: Five taxa of the form genus *Persicarioipollis*, the fossil angiospermous palynomorphs of *Polygonum*, obtained from Peikang area of central Taiwan and Kuanmiao Section of southern Taiwan are described. Two new species (*Persicarioipollis peikangensis* Shaw, sp. nov. and *Persicarioipollis taiwanensis* Shaw, sp. nov.), one variety (*Persicarioipollis minus gihuensis* Shaw, var. nov.) and three new combinations (*Persicarioipollis vulgaris* (Huang) Shaw, comb. nov., *Persicarioipollis densoreticulatus* (Huang) Shaw, comb. nov., and *Persicarioipollis minus* (Huang) Shaw, comb. nov.) are reported.

KEY WORDS: Fossil polygonaceous palynomorphs, Taxonomy, Taiwan.

INTRODUCTION

Polygonum, about 300 spp., is widely distributed in the cold and warm regions of the world, especially abundant in northern hemisphere, including 37 taxa and one doubtful species in Taiwan (Kuo *et al.*, 1996). *Persicarioipollis* (named for the fossil pollen of *Polygonum*) is distributed commonly in the Oligocene, Miocene, Pliocene, Pleistocene and Holocene formations of Taiwan (Huang, 1980, 1988). Pollen grains of the genus *Persicarioipollis* were found in rocks ranging in age from the Paleocene to the present (Muller, 1981).

MATERIALS AND METHODS

The locality of the samples from the well PK-3, GH-1 and SYH-1 in Peikang area of central Taiwan refers the reader to my previous publication (Shaw, 1995). However, the locality of the samples from Kuanmiao Section of southern Taiwan refers the reader to my another previous publication (Shaw, 1985). The extraction of fossil palynomorphs was treated with 10% KOH for the dissolution of humic materials. Heavy solution of ZnCl₂ was used for flotation (*S. G.* 1.8-2.2). 30% HCl and 52% HF were used for maceration of the laterite pebble samples.

Photomicrographs were taken with a Zeiss Axiophot microscope equipped with an automatic camera using Kodacolor Panatomic X (16 DIN) film. For fossil identification, the standard references used by Jansonius and Hills (1976), Huang (1980), Sung and Tsao (1978), and Zhu *et al* (1985) were adopted.

RESULT AND DISCUSSION

Persicarioipollis is distributed commonly in the Oligocene, Miocene, Pliocene, Pleistocene and Holocene formations of Taiwan (Huang, 1988). Five taxa of the form genus *Persicarioipollis*, the fossil angiospermous palynomorphs of *Polygonum*, were obtained from Peikang area of central Taiwan and Kuanmiao Section of southern Taiwan. Two new species (***Persicarioipollis peikangensis* Shaw, sp. nov.** and ***Persicarioipollis taiwanensis* Shaw, sp. nov.**), one variety (***Persicarioipollis minus ginhuenensis* Shaw, var. nov.**) and three new combinations (***Persicarioipollis vulgaris* (Huang) Shaw, comb. nov.**, ***Persicarioipollis densoreticulatus* (Huang) Shaw, comb. nov.**, and ***Persicarioipollis minus* (Huang) Shaw, comb. nov.**) are reported as below.

SYSTEMATIC TAXONOMIC TREATMENT

Class Dicotyledonae Order Polygonales Family Polygonaceae

Genus 1. *Persicarioipollis* Krutzsch 1962. Geologie, Jahrg. 11, no. 3, p. 282; Krutzsch 1966 Geologie, Beih. 55, p. 29.

Type Species: ***Persicarioipollis meusell* Krtz.**

Polygonacidites Sah & Dutta 1968; Huang in *Taiwania* 25: 94. 1980.

New diagnosis in Krutzsch 1966 (Geologie, Beih. 55, p. 29): Amb circular to oval, figure broadly lenticular to globular; surface with reticulum palisades (= polyforate) with a covering reticulum; underneath the major sculpture often a double row of "verrucae" that may be fused in part; further verrucae may occur in the foramina; pores small, open, only one in every 2-5 foramina and thus strongly variable in number; inner wall layer distinctly smooth (Jansonius and Hill, 1976).

Key to species (Compiled from Huang (1980))

1. Grains 3-4-colporate (6) *Persicarioipollis peikangensis*
1. Grains pantoporate
 2. Grains less than 21 μ m in width(3) *Persicarioipollis minus*
 2. Grains more than 22 μ m in width
 3. The lacuna about 1-3 μ m wide, the muri 1 μ m wide (2) *Persicarioipollis densoreticulatus*
 3. The lacuna more than 3 μ m wide, the muri more than 2 μ m wide
 4. Grains amb less than 26 μ m in width (4) *Persicarioipollis minus var. ginhuenensis*
 4. Grains amb 31-49 μ m in width (1) *Persicarioipollis vulgaris*
 4. Grains amb more than 50-60 μ m in width (5) *Persicarioipollis taiwanensis*

(1) *Persicarioipollis vulgaris* (Huang) Shaw, *comb. nov.*

Pl. 1; Figs. 1, 2

Polygonacidites vulgaris Huang, in *Taiwania* 25: 95. 1980.

Grains pantoporate; spheroidal to subspheroidal; about 31-49 μ m wide; surface view lopho-reticulate, lacuna about 3-8 μ m wide, muri 2-3.5 μ m thick; lateral view baculate, clavate or echinate; exine 1.5-5 μ m thick.

Stratigraphic occurrence: It was discovered from the core of well SYH-1 1323-1342m, mid-western Taiwan, lower Miocene (Shaw, 1995).

Selected slide: SYH-1 1323-1342-(3); Pl. 1; Figs 1,2.; film 83-42-27, 83-43-28; CPC Micropaleontology Lab.

Taxonomic affinity: This species and the other five species described in this section are similar to the extant species of *Polygonum* of Polygonaceae.

(2) *Persicarioipollis densoreticulatus* (Huang) Shaw, *comb. nov.*

Pl. 1; Fig. 5

Polygonacidites densoreticulatus Huang, in *Taiwania* 25: 94. 1980.

Grains pantoporate; spheroidal to subspheroidal; about 25-35 μ m wide; surface view lopho-reticulate, lacuna about 1-3 μ m wide, muri 1 μ m thick; lateral view clavate or echinate.

Stratigraphic occurrence: It was discovered from the Formation B of the Kuanmiao section of the Pleistocene (Shaw, 1985).

Selected slide: KC-1-13-(1); Pl. 1; Fig 5.; film 83-27-18; CPC Micropaleontology Lab.

(3) *Persicarioipollis minus* (Huang) Shaw, *comb. nov.**Polygonacidites minus* Huang, in *Taiwania* 25: 95. 1980.**(4) *Persicarioipollis minus* (Huang) Shaw var. *ginhuensis* Shaw, *var. nov.*** Pl. 1; Figs. 6, 7

Grains pantoporate; spheroidal to subspheroidal; about 22-26 μ m wide; surface view lopho-reticulate, lacuna about 4-7 μ m wide, muri 3-5 μ m thick; lateral view verrucate, clavate or echinate.

Stratigraphic occurrence: It was discovered from the core of the GH-1 1384m, mid-western Taiwan, lower Miocene (Shaw, 1995).

Holotype: Slide GH-1-1384-(6); Pl. 1; Figs 6,7.; film 105-39-4, 105-40-5; CPC Micropaleontology Lab.

Comment: This variety differs from *Persicarioipollis minus* (Huang) Shaw in having wider lacunae and thicker muri.

(5) *Persicarioipollis taiwanensis* Shaw, *sp. nov.*

Pl. 1; Figs. 8, 9

Grains pantoporate; spheroidal to subspheroidal; about 50-60 μ m wide; surface view lopho-reticulate, lacuna about 6-10 μ m wide, muri 6-9 μ m thick; lateral view clavate or echinate.

Stratigraphic occurrence: It was discovered from the Upper Gutingkeng Formation of the Kuanmiao section of the Pleistocene (Shaw, 1985).

Holotype: Slide KC-1-186-(1); Pl. 1; Figs 8, 9; film 96-23-16, 96-24-17; CPC Micropaleontology Lab.

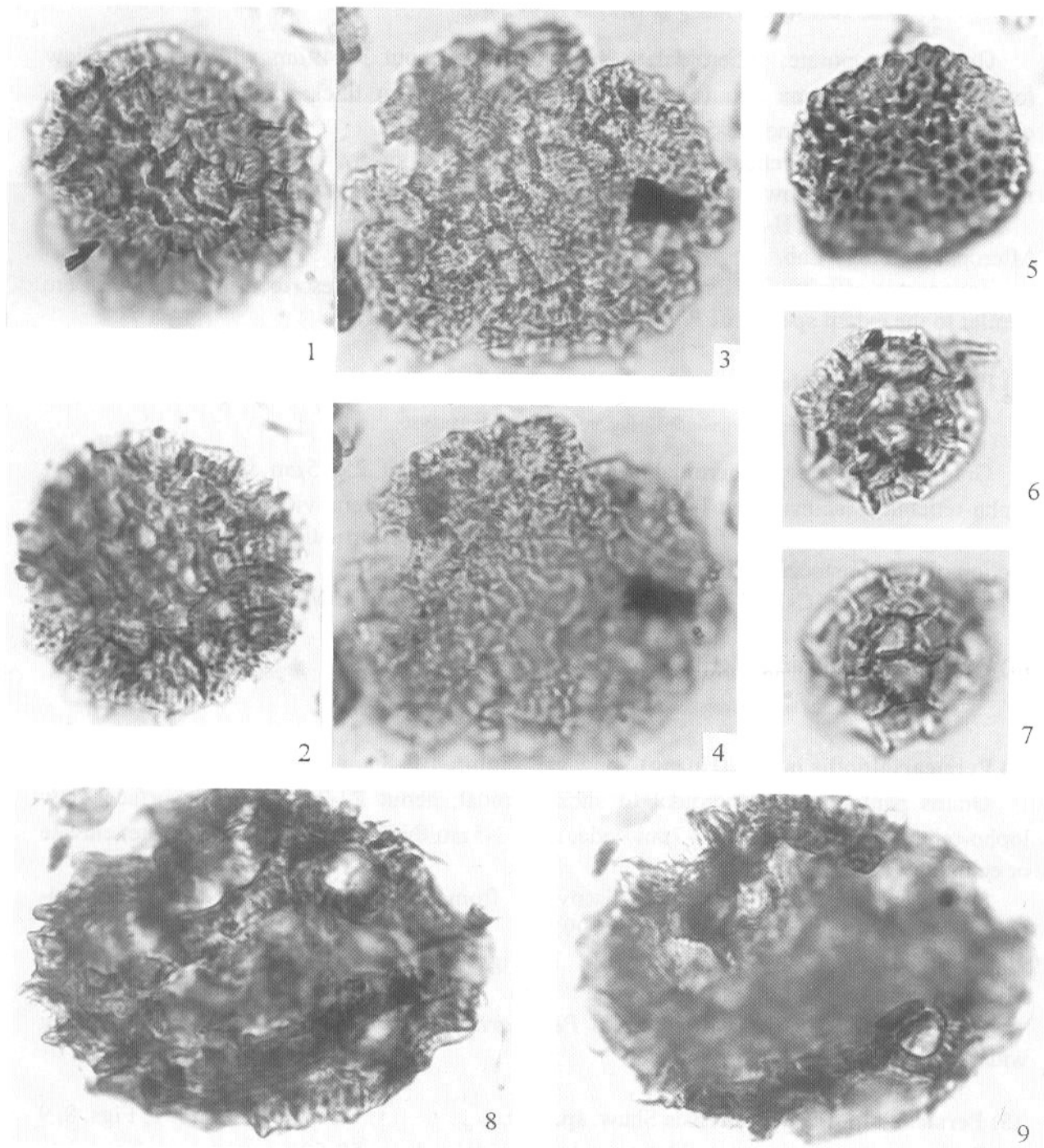


PLATE 1 (All figures x 1450)

Figs. 1, 2. *Persicarioipollis vulgaris* (Huang) Shaw, *comb. nov.* (Film 83-42-27, 83-43-28)

Figs. 3, 4. *Persicarioipollis peikangensis* Shaw, *sp. nov.* (Film 114-42-10, 114-43-11)

Fig. 5. *Persicarioipollis densoreticulatus* (Huang) Shaw, *comb. nov.* (Film 83-27-18)

Figs. 6, 7. *Persicarioipollis minus* var. *ginhuensis* Shaw, *var. nov.* (Film 105-39-4, 105-40-5)

Figs. 8, 9. *Persicarioipollis taiwanensis* Shaw, *sp. nov.* (Film 96-23-16, 96-24-17)

(6) *Persicarioipollis peikangensis* Shaw, sp. nov. Pl. 1; Figs. 3, 4

Grains 3-4-colporate; spheroidal to subspheroidal; about 46-55 μ m wide; surface view lopho-reticulate, lacuna about 2-9 μ m wide, muri 1.5-3 μ m thick; lateral view verrucate, clavate or echinate.

Stratigraphic occurrence: It was discovered from the core of well PK-3 1941-1942m, equal to Mushan Formation of northwestern Taiwan, lower Miocene (Shaw, 1995).

Holotype: Slide PK-3-1941-1942-(5); Pl. 1; Figs 3, 4.; film 114-42-10, 114-43-11; CPC Micropaleontology Lab.

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摘 要

本文描述於台灣中部及南部地層中，發現的被子植物蓼科花粉化石蓼粉層 (*Persicarioipollis*) 形態屬的五個分類群。其中有兩種新種 (*Persicarioipollis peikangensis* Shaw, sp. nov., *Persicarioipollis taiwanensis* Shaw, sp. nov.)，一種變種 (*Persicarioipollis minus* var. *ginhuensis* Shaw, var. nov.)，另外三種則為新組合種 (*Persicarioipollis vulgaris* (Huang) Shaw, comb. nov., *Persicarioipollis densoreticulatus* (Huang) Shaw, comb. nov., *Persicarioipollis minus* (Huang) Shaw, comb. nov.)。

關鍵辭：蓼科化石花粉、分類、台灣。