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Medicinal Plants in China: Production and Trade (***)

INTRODUCTION

In China, medicinal plants play an important role in the health service, by no means inferior to that of synthetic drugs and antibiotics. This fact is well reflected in the latest edition (1985) of the Chinese Pharmacopoeia, of which the first volume is completely devoted to the crude drugs and their various preparations, with a grand total of 713 items, and the predominant majority of them are of botanical origin, in comparison with the second volume, which is specialized in the chemical, antibiotic and biological medicaments along with their preparations, totaling 776 items. The importance of medicinal plants is also evidenced from the fact that traditional Chinese drugs, which consist of nearly exclusively medicinal plants, are estimated to account for 30-50 per cent of total medicament consumption in recent years. Medicinal plants, thus, have received much attention to their production and trade in China.

GENERAL STATUS

After a nation-wide survey, it has been found that more than five thousand species of medicinal plants are being used in China nowadays (Table 1).

All the medicinal plants recorded in the Chinese Pharmacopoeia are produced either in the wild state or under cultivation. The annual output of crude drugs is around 700,000 tons. The important medicinal plants producing in large amount are listed in Table 2.

The cultivating area of medicinal plants reached four hundred and sixty

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Table 1 — The up-to-date Chinese medicinal plants identified.

<table>
<thead>
<tr>
<th>Origin</th>
<th>Medicinal Plants included</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thallophytes</td>
<td>281</td>
</tr>
<tr>
<td>Bryophytes</td>
<td>39</td>
</tr>
<tr>
<td>Pteridophytes</td>
<td>395</td>
</tr>
<tr>
<td>Gymnosperms</td>
<td>55</td>
</tr>
<tr>
<td>Angiosperms</td>
<td></td>
</tr>
<tr>
<td>Dicotyledons</td>
<td>3690</td>
</tr>
<tr>
<td>Monocotyledons</td>
<td>676</td>
</tr>
<tr>
<td>Total</td>
<td>5136</td>
</tr>
</tbody>
</table>

thousand hectares. More than three thousand items of patent medicines derived from crude drugs have been produced in eight hundred pharmaceutical factories.

In China, traditional Chinese medicine and Western medicine are both official in the health care system, so that the production of medicinal plants is either by traditional or modern methods (Fig. 1).

As to the foreign trade of medicinal plants and their related products, the annual export value could reach five hundred million US dollars. There are about five hundred items of medicinal plants for exportation, only one-fifth of them are specific to the European countries. With regard to importation of medicinal plants, they are mainly tropic and subtropic ones, e.g., Amomum kravanh, Commpbora myrrrha, etc.

Table 2 — Chinese medicinal plants with greater productive importance.


* mainly cultivated.
SINO-EUROPEAN COLLABORATION

I would like to discuss and stress the Sino-European collaboration of medicinal plants and their products (Fig. 2) from the standpoint of production and trade.

Raw Materials

Dioscorea nipponica, D. zingiberensis (diosgenin), Podophyllum emodi (podophyllotoxin), Sophora japonica (rutin), Scopolia tigutica (hyoscyamine, anisodamine, anisodine), Datura inoxia, D. metel (scopolamine), Ephedra sinica (ephrdrine), Thevetia peruviana (cardiotonic glucosides), Berberis poiretii (berberine, berbamine), Centella asiatica (asiaticoside), Ginkgo biloba (total extract), Cephalotaxus mannii (C. hainanensis) (harringtonine, homoharringtonine).

Sweetness

Glycyrrhiza glabra, G. uralensis; Rubus suavissimus, Siraitia grosvenorii (Momordica grosvenosii), Stevia rebaudiana (stevioside).
Bitterness

Artemisia absinthium, Berberis poiretii, Cichorium intybus, Citrus aurantium, Gentiana scabra, Humulus lupulus, Swertia japonica, Taraxacum officinale.

Spices, Essential Oils


Natural Colouring Matter

Carthamus tinctorius (red), Curcuma longa (yellow), Hippophae rhamnoides (orange), Lithospermum erythrorrhizum (purple), Rosa rugosa (red), Rubia cordifolia (red), Gardenia jasminoides (yellow), Capsicum annua (red), Opuntia dillenii (violet).

Natural Insecticides

Melia azedarach, M. toosendan, Tripterygium wilfordii, T. hypoglauucum, Artemisia spica, Sophora flavescens, Milletia pachycarpa.

Traditional European Drugs

Achillea millefolium, Adonis amurensis, Aloe vera, Althaea officinalis, Chel-
donium majus, Convallaria majalis, Digitalis lanata, Equisetum arvense, Inula helene- 
nium, Polygonum bistorta, Tilia mongolica, Tussilago farfara, Valeriana officinalis, 
Viscum album.

**Traditional Chinese Drugs**

Angelica sinensis, Astragalus mongholicus, Bupleurum chinense, Cistanche der-
sicola, Codonopsis pilosula, Corydalis yanhusuo, Dendrobium nobile, Epimedium 
sagittatum, Eucommia ulmoides, Fritillaria thunbergii, Gastrodia elata, Linguisti-
cum chuangxiong, Lonicera japonica, Morinda officinalis, Polygala tenuifolia, 
Polygonum multiflorum, Rheum palmatum, Salvia miltiorrhiza, Uncaria rhyncho-
phylla.

**Healthy Food** (incl. antisenility)

Acanthopanax senticosus, Astragalus mongholicus, Coix lacryma-jobi var. 
ma-yuen, Cordyceps sinensis, Cornus officinalis, Dioscorea opposita, Euphorbia 
longan arillus, Garnoderma lucidum, Juglans regia, Lilium brownii var. viridulum, 
Ligustrum lucidum, Lycium barbarum, Morinda officinalis, Nelumbo nucifera, 
Panax ginseng, P. notoginseng, Schisandra chinensis, Tremella fusiformis, Zizyphus 
jujuba var. inermis.

**Healthy Drinks**

Actinidia chinensis (fr), Chrysanthemum morifolium (inflor), Crataegus pin-
natifidus (fr), Hibiscus sabdariffa (calyx), Psidium guajava (fr), Ribes nigrum (fr), 
Rosa dahurica (fr.), R. coxburgii (fr.), Tamarindus indica (fr.), Vaccinium uliginos-
sum (fr.), Zizyphus jujuba var. spinosa (fr.).
SELECTED REFERENCES

XIAO PEIGEN, Some experience on the Utilization of Medicinal Plants in China. «Fito-
— Traditional experience of Chinese herb medicine, its application in drug research and
new drug searching. In: J. Beal and E. Reinhard (eds.) Natural Products as Medicinal
— Recent Developments on Medicinal Plants in China. «J. Ethnopharmacology», 7, 95-109
(1983).
— Utilization on Medicinal Plants: Recent Developments from Chinese Experiences. In:
XIAO PEIGEN and FU SHANLIN, Pharmacologically active substances of Chinese traditional
herbal medicines. In: L.E. Craker and J.E. Simon (eds.) Herbs, Spices and Medicinal
XIAO PEIGEN, Ethnopharmacologic investigation on Pharmacologically Active Principles from
Chinese Medicinal Plants. In: Lei Hai-peng et al. (eds.) Proceedings of the international
XIAO PEIGEN and CHEN KEJI, Recent Advances of Clinic studies of Chinese traditional Me-