168-

STANDARDIZATION OF ACTIVE PRINCIPLES OF INDIGENOUS PHARMACOPOEIAL DRUGS FOUND IN WEST PAKISTAN

MUKHTAR AHMAD WAHID AND SAMIULLAH

North Regional Laboratories, Pakistan Council of Scientific and Industrial Research, Peshawar

(Received August 25, 1960)

Introduction

West Pakistan has an abundance of medicinal herbs [1-4] and their scientific utilization can play an important role in the development of local pharmaceutical industry. Exploitation of these drug resources would not only make us self-sufficient in respect of some of our requirements but might also help us to earn foreign exchange by exporting surplus quantities.[8] Some of these herbal drugs are of recognised therapeutic value and if they come up to the standards laid down by some pharmacopoeias they would be a valuable asset to the country both from the medicinal and economic points of view. Each pharmacopoeia describes a certain lower limit of the percentage of active principles in a drug and if that condition is fulfilled, the drug can be accepted as official. Since no systematic work has so far been done in this direction it was considered advantageous to estimate the active ingredients of some important local pharmacopoeial drugs and thus to standardize them.

Materials and Methods

Sampies of crude drugs used in this work were collected from the Experimental Farm of the North Regional Laboratories or from different localities of the north-western region of West Pakistan. A few samples were also obtained from the local market. They were dried in the shade or in the sun as required and the percentage of active principles was calculated on the basis of air dried weight of the sample. Some drugs were freshly handled because of the volatile nature of their active constituents and the percentage was calculated on the basis of the weight of fresh sample. The values of active principles represent the average of at least three determinations in each case. All drugs were analysed according to the methods prescribed in the British Pharmacopoeia 1958 or the Indian Pharmaceutical Codex 1953 and the results have been shown in Tables 1 and 2.

Discussion

A perusal of Table 1 shows that above mentioned drugs are standard and can be used where such pharmacopoeial drugs are required except oil of chenopodium and oil of eucalyptus because they fall short of the pharmacopoeial requirements. Oil of chenopodium according to B.P.C. 1954 should contain 65% ascaridol while that from the local herb contains only 46.0% ascaridol. Since its anthelmintic activity is well established a higher dosage level (5-20 minims) can be tried.[9] Oil of eucalyptus can be used in perfumery or for mineral flotation.[9] Colchicum corm contains 0.26-0.27% of colchicine and is a very good substitute for *C. autumnale* L., an important drug of the British Pharmacopoeia 1958, and can be recognised by that pharmacopoeia.

TABLE 2.—PERCENTAGE OF ACTIVE PRINCIPLES OF INDIGENOUS DRUGS INCLUDED IN THE INDIAN PHARMACEUTICAL CODEX 1953.

Botanical name	Common name	Source	Percentage of active principles	Lower pharmacopoeial limit
Aconitum chasmanthum, Stapf ex Holmes.	Aconite	Wild	Root: 0.63-3.8 indaconitine	Not specified
Artemisia maritima, Linn.	Wormseed	Wild	Buds & leaves: 0.71-1.81 santonin	0.75%
Berberis lycium, Royle	Indian barberry	Wild	Root: 4.31 berberine.	1.00%
Colchicum luteum, Baker	Colchicum seed	Wild	Seed: 0.40-0.44 colchicine	0.3%
Datura fastuosa, L.	Datura	Cultivated	Leaves: 0.12-0.26 hyoscyamine	0.25%
D. stramonium, Linn.	Stramonium	Wild	Seed: 0.23-0.29 hyoscyamine	0.2%
Plantago ovata, Forsk	Isfaghul	Cultivated	Seed: 7.0-9.0 ml. absorbancy	10.0 ml.
Polygala chinensis, Linn.	Indian senega	Wild	Root: 1.97 saponin	Not specified
Valeriana wallichii, DC.	Indian valerian	Wild	Root: 0.25-0.89 percent v/w volatile oil	0.5%

From Table 2 it is evident that all drugs given in this table fulfil the standards and requirements as laid down by I.P.C. 1953 and can be used where such drugs are specified. Absorbancy test of *Plantago ovata* is, no doubt, a bit low and can be raised in value by improved methods of cultivation. It can be used even as it is, because its action on intestines in diarrhoea or dysentery is only mechanical due to some mucilage and not chemical.

Acknowledgement.—The authors are greatly indebted to Col. M. K. Afridi for his keen interest in the present work and to Mr. S.M.A. Kazmi, for supplying the drug samples.

References

1. M. A. Kazmi and I. A. Siddiqui, Pakistan J. Forestry, **3**, 186-221 (1953).

TABLE 1.—PERCENTAGE OF ACTIVE PRINCIPLES OF INDIGENOUS DRUGS INCLUDED IN THE BRITISH PHARMACOPOEIA 1958.

Botanical name	Common name	Source	% of active principles	Lower pharmacopoeial limit
Atropa acuminata, Royle ex Lindley	Indian belladonna	Cultivated	Leaves: 0.54 hyoscyamine Leaves: 0.30-0.66 hyoscyamine	0.40%
Carum carvi, L.	Caraway	Market	Fruit: 3.30-3.50 v/w volatile oil	3.5%
Chenopodium ambrosioides, L. Var. anthelmintic	American wormseed	Wild	Plant: 0.17-0.25 volatile oil containing 46.0 percent ascaridol	Oil containing 65% ascaridol
Cinnamomum camphora, (L.) Nees & Eberm	Camphor.	Cultivated	1. Fresh leaves-0.60 camphor 2. Fresh twigs: 0.20 camphor	Not specified
Citrus aurantium, L. var. bigaradia	Bitter orange peel[6]	,,	Fresh peel: 0.94 v/w volatile oil	2.5 percent in dried peel
C. medica, L. var. limon.	Lemon peel	,,	Fresh peel: 0.30 v/w volatile oil containing 5.2 percent citral	Oil containing 4.0% citral
Colchicum luteum, Baker. (substitute for *C. autumnale*, L.)	Colchicum	Wild.	Corn: 0.26-0.27 colchicine	0.25%
Datura stramonium, L.	Stramonium	Wild	Leaves: 0.23-0.32 hyoscyamine	0.25%
Dryopteris filixmas (L.) Schott.	Male fern[5]	Wild	Rhizome: 2.50-3.39 filicin	1.5%
Ephedra gerardiana, Wall	Ephedra	Wild	Shoots: 0.83-2.04 ephedrine	1.25% (B. P. C. 1954)
Eucalyptus globulus, Lab.	Eucalyptus	Cultivated	Fresh leaves: 0.50-0.83v/w volatile oil containing 40-45 cineol	Oil containing 70 % cineol
Hyoscyamus niger, L.[7]	Henbane	Wild Cultivated	Leaves: 0.035-0.058 hyoscyamine Leaves: 0.30-0.045 hyoscyamine.	0.05%
M. piperita, L.	Peppermint	Cultivated	Fresh leaves and flowering tops: 0.15 v/w volatile oil	Not specified
Papaver somniferum, Linn.	Poppy	Market	Opium: 7.96-10.55 morphine	9.5%
Podophyllum emodi, Wall	Indian podophyllum	Wild	Rhizome & roots (i) 11.50-15.56 podophyllin (ii) 3.19-4.10 podophyllotoxin	Not specified
Rheum emodi, Wall	Rhubarb	Wild	Root: 4.30 cathartic principles	Not specified

2. I. I. Chaudhri, Pakistan J. Forestry, 1, (1951).
3. Bashir Ahmad et al., *Report on Medical Plants and Herbs of Azad Kashmir Territory* (Ministry of Industries, Govt. of Pakistan, Karachi, 1950), p. 26.
4. M.S., Khan *Report on Survey of Medical Herbs in the N.W.F. Province* (Tarnab Farm, Peshawar, 1952).
5. M. A. Wahid, Pharmacy Pakistan, **3**, 433-36 (1957).
6. M.A. Wahid and Samiullah, Proc. P.A.A.S., Chem. Sec. (1958).
7. M.A. Wahid, and S.M.A. Kazmi (under publication).
8. A. A. Watson, Medicus. **6**, 45-51 (1953).
9. *Wealth of India*, C.S.I. R., Delhi, Vol. II,1950, pp. 127-128.