PHARMACOLOGY

Milk-ejecting Action of Ergot

It is known that adrenalin inhibits milk ejection[1]. In an attempt to determine whether this inhibition is central or peripheral a series of experiments were performed on rats. The effect of prior administration of ergotamine on the adrenalin-induced black was studied. In the course of this investigation it appeared that ergotamine and ergometrine also had a milk-ejecting action of their own. This property of ergot causing milk ejection does not appear to have been described before.

Milk ejection has been assessed by the increase in weight after suckling of the young rats (8–10 days after birth) separated overnight. Adrenalin as well as atropine and alcohol block the ejection of milk in rats by preventing the release of oxytocin (personal observation). Adrenalin in doses of 1 μgm. and more when administered intraperitoneally always inhibits the milk-ejecting reflex, but when ergotamine ('Gynergen' Sandoz, Ltd.) or ergometrine (Sandoz, Ltd.) is administered to the mother (200–250 gm.) in doses of 50–100 μgm. intraperitoneally half an hour before the administration of adrenalin there is no inhibition of milk ejection. When the lactating mothers were injected with an ergot preparation just prior to suckling the litters gained more weight after suckling than they did normally. The fact that ergometrine also, in addition to ergotamine, has this property of causing milk ejection indicates that ergot does so, not by specifically reversing the action of adrenalin but by itself causing milk ejection. When adrenalin and ergotamine are administered simultaneously to the mother just before suckling there is no inhibition of milk ejection. The action of ergometrine and ergotamine was then studied on six litters where the milk ejection reflex had been blocked by prior administration of atropine (60–120 μgm. intraperitoneally immediately before suckling) and 7·5 per cent alcohol (5 ml./100 gm. body-weight orally 30 min. prior to suckling). It was found that when ergotamine or ergometrine was administered to the mother just prior to suckling neither alcohol nor atropine caused any inhibition of milk ejection. Normally a dose of 3–10 μgm. atropine causes a complete inhibition of milk ejection which can only be reversed by oxytocin. Fig. 1 shows the increase in weight of a litter after suckling when no drug was administered as compared to the increase in weight of the same litter on another day when adrenalin (1 μgm.) and, on another day, adrenalin and ergometrine (50 μgm.) were administered just prior to suckling.

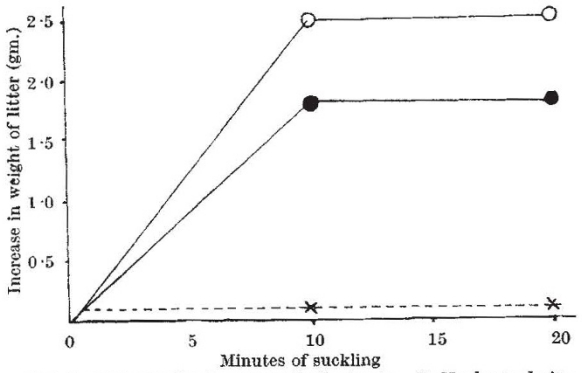

Fig. 1. Milk ejection in unanæsthetized rats. ○, No drug administered; ●, adrenalin (1 μgm.) and ergometrine (50 μgm.) intraperitoneally; ×, adrenalin (1 μgm.) intraperitoneally

The results described in brief indicate that ergot, in addition to its many actions, also causes milk ejection. It is unlikely that ergot causes milk ejection by releasing oxytocin, and we suggest that ergot, when administered to rats, has a direct action on the lactating myoepithelium and causes its contraction. Ergot has for long been known to possess an oxytocic action on the uterus, and it appears to possess another oxytocin-like action causing milk ejection.

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[1] Cross, B. A., *J. Endocrinol.*, **9**, 7 (1953).

Indian Substitutes of Male Fern in Pharmacognosy

Dryopteris filix-mas (L.) Schott, commonly known as the male fern, is a good tænicide and is included in the pharmacopœias of all countries and also in the International Pharmacopœia. India, with her vast resources of drug plants, has many indigenous species of *Dryopteris* growing in the Himalayas, although the true male fern is not indigenous. With the view of finding suitable Indian substitutes of the official drug, phytochemical and pharmacognostical investigations on the following 18 members of the family Aspidiaceae were carried out. *Dryopteris hirtipes* (Bl.) O. Ktze., *D. scotti* (Bedd.) Ching, *D. cochleata* (Don) O. Ktze., *D. barbigera* (Moore) O. Ktze., *D. serratodentata* (Bedd.) Hayata, *D. fibrillosa* (Clarke) Hand-Mzt., *D. rosthernii* (Diels) C. Chr., *D. paleacea* (Don) Hand-Mzt., *D. blanfordii* (Hope) C. Chr., *D. chrysocoma* (Christ) C. Chr., *D. ramosa* (Hope) C. Chr., *D. pulvinulifera* (Bedd.) O. Ktze., *D. splendens* (Hk.) O. Ktze., *D. sparsa* (Don) O. Ktze., *Ctenitis apiciflora* (Wall) Ching, *C. nidus* (Clarke) Ching, *Hypodematium crenatum* (Forsk) Kuhn, *Cyrtomium falcatum* Presl.

Chemical analyses have shown that all the species of *Dryopteris* (with the exception of *D. sparsa*) and both the species of *Ctenitis* contain filicin much above the official requirement (B.P. and U.S.P. require not less than 1·5 per cent of filicin in the crude drug). *Hypodematium* and *Cyrtomium* are practically useless. Of particular interest is the species *D. chrysocoma*, which contains the maximum amount of the active principle (4·3 per cent of filicin in the crude drug). This, together with three other species, namely, *D. ramosa* (3·8 per cent of filicin in the crude drug), *D. barbigera* (2·2 per cent of filicin in the crude drug), and *D. cochleata* (1·8 per cent of filicin in the crude drug), which grow prolifically in a wild state, could be commercially exploited to great advantage.

A valuable field test for species rich in the active principle is found to be a greenish tinge of the cut surface of the rhizome and stipe bases, which colour is retained long after drying. Species poor in this principle either show no colour or turn brown soon after cutting.

An intensive pharmacognostic study has revealed that the species containing oleoresin and filicin

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