SHORT COMMUNICATION

The Effect of the Aqueous Extract of Cynomorium coccineum on the Epididymal Sperm Pattern of the Rat

H. A. Abd El-Rahman,* A. A. El-Badry, O. M. Mahmoud and F. A. Harraz
Department of Veterinary Medicine, College of Agriculture and Veterinary Medicine, King Saud University, P.O.Box 1482, Buraydah, Qassim Branch, Saudi Arabia

An aqueous extract of Cynomorium coccineum was administered by stomach tube to ten mature male Wistar rats, at a dose of 47 mg/100 kg body weight/day for 14 consecutive days. Ten rats were kept as controls and received normal saline by oral route at the same dosing interval. Sperm was collected from the epididymes after decapitation. The results revealed that the water extract of the Cynomorium coccineum induced significant increase in the sperm count, improved the percentage of live sperm and their motility and decreased the number of abnormal sperm. Testicular histology showed increased spermatogenesis and seminiferous tubules full of sperm in the treated group compared with the controls. Copyright © 1999 John Wiley & Sons, Ltd.

Keywords: Cynomorium coccineum; Spermogram; rat testis.

INTRODUCTION

Medicinal plants have been widely used in the treatment of diverse ailments. The natives in the Gulf area use some plants such as the date palm as an aphrodisiac (Omar and Shanawany, 1986; El-Mougy et al., 1991). Cynomorium coccineum (family Cynomoraceae), locally known as Som-El-Ferakh, is a blackish leafless parasitic plant destitute of chlorophyll (Tackholm, 1974; Migahid, 1978; Mandaville, 1990). The natives in Qatar use it (mainly with honey) as a tonic and aphrodisiac (Ageel et al., 1987). The daily oral administration of the aqueous extract of Cynomorium coccineum to immature rats (20 days old) for 6 days induced precocious spermatogenesis (Harraz et al., 1996). These results urged us to evaluate the effect of the aqueous extract of the plant on epididymal sperm pattern of mature rats, as well as the histological changes that may be induced in the testis.

MATERIALS AND METHODS

Animals. Twenty adult male Wistar rats weighing 140–150 g were used in this experiment. Animals were brought from the animal-breeding unit of King Saud University. All animals were maintained from birth in a photoperiod of 14 h light and housed in a wire bottomed cage with free access to food (Simonsen rat pellets) and water. Room temperature was maintained at approximately 20°C, and the animals were divided into treated and control groups of ten rats each.

Plant materials. Cynomorium coccineum was collected from Qassim province, Saudi Arabia and classified by the Staff of the Botany Department, College of Science, King Saud University, Saudi Arabia. Voucher specimens of the plant were deposited in the Department of Veterinary Medicine, College of Agriculture and Veterinary Medicine, Qassim, Saudi Arabia.

Figure 1. The effect of Cynomorium coccineum extract on the male sex organ weights of rats.
Preparation of lyophilized aqueous extract of *C. coccineum*. The fresh inner pulp of stem and root (1100 g) was blended with water (300 mL) in a mixer. The suspension was filtered under suction, and the combined filtrate (900 mL, rosy in colour) was freeze-dried using a labconco freeze-dryer-18 model 75018 to give rosy granules (88.5 g).

Experimental procedures. The rats of the treated group were given the aqueous extract of *C. coccineum* at a dose of 47 mg/100 g body weight/day, equal to 1/20 of the LD$_{50}$ (Harraz et al., 1996). This dose represents the calculated therapeutic dose for most drugs or extracts. The extract was administered daily, through a stomach tube, for 14 days. The control animals were given saline solution of similar quantity to the extract by the oral route. On day 15 all animals were killed by decapitation and the testes, epididymes and seminal vesicles were dissected out and weighed. The epididymal content was obtained by macerating known weights in a watch glass containing 2.9% sodium citrate solution in a ratio of 1:10 weight by volume. The sperm cell concentration, percentage of live sperm, progressive motility and percentage of abnormal sperm were determined according to Miller and Rass (1952).

Samples from dissected testes were fixed in 10% formol saline, processed in wax and sectioned at 5 µm. Sections were stained with haematoxylin and eosin (Bankroft and Stevens, 1990) for histological studies. The results obtained were statistically analysed using Students t-test.

**RESULTS**

Table 1 shows highly significant ($p < 0.01$) weight changes of the body, testes, seminal vesicles and epididymes of the treated group compared with the controls. Moreover, all parameters of the spermogram were significantly improved in the treated rats when compared with controls. Histological examination of the testis of the treated animals revealed increased spermiogenesis and seminiferous tubules full of sperm in the treated group compared with the controls (Fig. 3 and 4).

**DISCUSSION**

Some medicinal plants are used to improve libido in man but in most instances their mode of action is largely understood. In this regard, El-Mougy et al. (1991) found that the palm extract induced a prominent role in improving sexual function through its agonistic effect with the normal testosterone secreted. Also, Omar and Shanawany (1986) found that the same extract increased the number and motility of the ejaculated sperm.

The process of sperm formation is controlled by many factors and testosterone plays a key role in it. This
hormone is essential for the growth and division of the germinal cells of the seminiferous tubules (Burger and de Kretsner, 1989).

In our experiment, the oral administration of water extract of *Cynomorium coccineum* to mature rats influenced the spermogram as shown in Table 1 and Fig. 2. We have not isolated the active constituents of the plant which seems to have a testosterone-like action. Its influence on the testis may be either direct or through an activator of the normal machinery that regulates the process of spermatogenesis. In this regard, our findings support the results of Harraz *et al.* (1996) who found that the water extract of *Cynomorium coccineum* induced early spermatogenesis in immature Wistar rats (20 days old and weighing 37–39 g). The process of spermatocytogenesis in Wistar rats was reported to begin normally at the age of 30 days and that of spermiogenesis started at 50 days (Yves and Bernard, 1969; Brown *et al.*, 1975; Mahmoud *et al.*, 1992). Harraz *et al.* (1996) concluded that the extract of the plant might have a testosterone-like action which had a stimulatory effect on the rat testis.

In conclusion we believe that this plant, at the dose given in this study, may be promising in improving fertility.

**REFERENCES**


