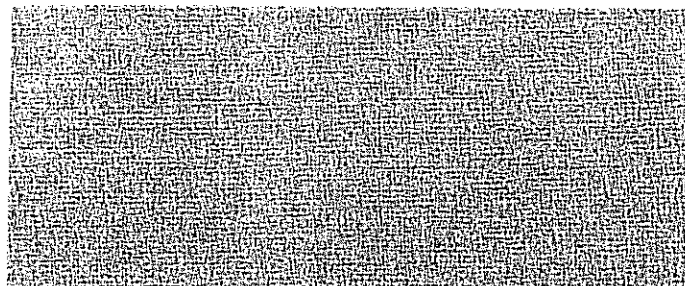


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Prof. Dr. T.I. Kanui* and Prof. Dr. H. Enbergs**

* Department of Animal Physiology, University of Nairobi, Kenya

** Institut für Anatomie, Physiologie und Hygiene der Haustiere der Universität Bonn,
Abteilung Anatomie und Physiologie

Effects of *Nux vomica* D4, D6, D10, *Nux vomica-Homaccord ad us. vet.* and *Atropinum compositum ad us. vet.* on intestinal motor activity in vitro

Prof. Dr. T.I. Kanui* and Prof. Dr. H. Enbergs**

* Department of Animal Physiology, University of Nairobi, Kenya

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Key words: *Nux vomica*, *Atropinum compositum*, homeopathic dilutions, intestinal contractility.

Summary

The effects of *Nux vomica* (D4, D6, D10), *Nux vomica-Homaccord ad us. vet.* and *Atropinum compositum ad us. vet.* were studied in vitro, using rabbit jejunum. *Nux vomica* D4, D6, D10 and *Nux vomica-Homaccord ad us. vet.* caused marked increases (4.8 %, 43.4 %, 65 % and 49.3 % respectively) in amplitude of contraction of the jejunum. D4 caused significant ($p < 0.05$) increases in only 5 experiments, while D6, D10 and *Nux vomica-Homaccord ad us. vet.* caused highly significant ($p < 0.01$) increases in amplitude of contraction in all experiments. These preparations caused either a decrease or no change in the number of contractions. *Atropinum compositum ad us. vet.* caused a highly significant ($p < 0.05$) decrease in both the amplitude and number of contractions of the jejunum. It is concluded that the above homeopathic preparations have a profound effect on intestinal smooth muscle and or nerve activity. These effects may account for the therapeutic actions of the above preparations, in vivo. The mechanisms via which the effects of these substances are achieved still remain unknown.

Introduction

The treatment of ailments in both human and veterinary medicine, using conventional methods i.e. antibiotics and or chemical therapies leads to high levels of these substances in circulation and their subsequent appearance in animal products. These animal products are not acceptable by consumers.

Thus the farmer may suffer substantial economic loss. If ultra low doses are used there is no risk of toxic side effects or accumulation in animal products. Therefore, the use of therapeutic preparations in ultra low concentration is recommended to avoid adverse effects and economic loss to the farmer, drug dependence and or tolerance.

Though the mechanisms of action of homeopathic therapies is not well known, there is substantial evidence that administration of these therapies is effective in reversing adverse reactions. For example aspirin in ultra low doses causes a transient shortening of internal bleeding time (Lalanne et al., 1991). Similarly, ultra low doses of *Apis mellifica* and *Apium virus* prevents the development of erythema due to ultra violet radiation (Bildet et al., 1990). Also in ultra low doses, *Rhus toxicodendron* causes a significant amelioration of fibrositis (primary fibromyalgia) (Fisher et al., 1989).

Nux vomica, the powdered seeds of *Strychnos nuxvomica* is used empirically for many conditions. Its active principal is strychnine, which has a strong stimulant effect on the spinal cord and in large doses the medulla. In human medicine and in homeopathic quantities, either alone or in combination with other preparations, it is used for a variety of conditions. The conditions include: inflammations and cramps of the gastrointestinal tract, liver and bile disorders, constipation, haemorrhoids, disturbances caused by food, drugs and stimulants, headaches, neuralgias, cramps of hollow organs, sleep disturbances, nervous over-stimulation and ill-feeling (monograph of the Official Commission at the German Federal Drug Authority).

In Veterinary Medicine *Nux vomica* is used for functional disorders in the liver and gastrointestinal tract, spasmodic conditions of the alimentary tract with restlessness, colic, acute and chronic gastroenteritis, constipation, intervertebral disc disease and meteorism.

Atropinum compositum is used for the management of biliary, renal, intestinal colic, convulsive coughs and whooping cough. The mechanisms of action of ultra low doses of Nux vomica and Atropinum compositum in the amelioration of the wide variety of conditions is not known.

The aim of these experiments was to study the effects of Nux vomica (D4, D6, D10), Nux vomica-Homaccord ad us. vet.¹ (a combination of D4, D10, D15, D30, D200, and D1000) on gut motor activity in vitro. Also the effects of Atropinum compositum ad us. vet.¹ was studied.

Materials and Methods

Healthy New Zealand white rabbits from a commercial breeder were used. They weighed an average of 2.5 kg. They were fed on commercial rabbit pellets (Unga Feeds, Kenya LTD) during the one month acclimatization period, in the laboratory. Lighting was natural and was approximately 12 hr light and 12 hr darkness.

To harvest the jejunum the rabbits were rendered unconscious by a hard blow to the base of the cranium and bled out. The abdominal cavity was opened, the intestines exteriorised and the jejunum was detached. The digesta of the jejunum were removed by gravitational force, while passing tyrodes solution through its lumen. Three to four washings were required. The jejunum was then transversely cut into 1 inch long pieces. They were stored in a beaker containing tyrodes solution, through which oxygen was bubbled. The tyrodes solution was replaced with fresh solution every 20 minutes. The beaker was kept three quarters full of solution, which was maintained at 37.0°C.

The piece of jejunum to be mounted was gently picked with tissue forceps from the beaker. Cotton threads were needled through the cut ends, each on the alternative edge of the piece of jejunum. One end was anchored on the hooked end of the oxygen bubbling glass tube (manufactured in the laboratory). The other end was attached to the writing arm of the kymograph. The tissue was mounted on a perspex organ bath. The bath was filled with tyrodes solution, also maintained at 37.0°C.

Ten drops (0.7 ml) of each drug used were added into the organ bath, in which the jejunum was mounted. An equal volume of vehicle was added prior to every drug test. The following ultra low preparations were used i.e. Nux vomica D4, D6, D10, Nux vomica-Homaccord ad us. vet. and Atropinum compositum ad us. vet. Adrenaline and acetylcholine, drugs with well known pharmacological activity on the gut were also used for comparison. 10 drops of each drug were similarly administered. Recording of tissue motor activity started immediately after the drug was added. The amplitude (mm) of intestinal contractions and the number of contractions per second were determined.

The data obtained were evaluated using analysis of variance (ANOVA). Where comparison of data was restricted to two means the Student's *t*-test subsequent to ANOVA was used. Further statistical evaluation was performed using Fisher PLSD and Scheffe F-tests. The level of significance was set at $p < 0.5$ for Student's *t*-test and at 95% level for the latter two statistical tests.

Results

a) Effect of Nux vomica D4 on amplitude and number of contractions of the jejunum

i) Amplitude of contractions

Administration of Nux vomica D4 caused either no change or an increase in the amplitude of contraction of the jejunum. In 5 experiments there was a significant ($p = 0.0001-0.0495$, Student's *t*-test; Fisher PLSD and Scheffe F-tests at 95% level of significance) increase in the amplitude of contractions. In the rest of the experiments, however, there was no significant change in the amplitude of contractions of the jejunum when compared to controls. Overall Nux vomica D4 caused a 4.8% increase in the amplitude of contractions of the jejunum preparation above controls (Table 1).

ii) Number of contractions

Administration of Nux vomica D4 caused a significant ($p = 0.0001-0.0016$, Student's *t*-test; Fisher PLSD and Scheffe F-tests at 95% significance level) decrease in the number of contractions, in 6 experiments. In the rest of the 8 experiments however, Nux vomica D4 did not have any significant effect on the number of jejunum contractions. The overall effect of Nux vomica D4 was a 8.9% decrease

¹Heel GmbH, Baden-Baden (Germany)

Table 1: Effect of Nux vomica D4, D6, D10, Nux vomica-Homaccord ad us. vet. and Atropinum compositum ad us. vet. on amplitude and number of gut contractions.

Substance	% Change in amplitude of contractions	% Change in number of contractions
Nux vomica		
D4	+ 4,8	- 8,9
D6	+43,4	- 4,2
D10	+65,0	- 2,2
Nux vomica-Homaccord ad us. vet.	+49,3	+ 1,0
Atropinum compositum ad us. vet.	-38,4	-10,0

ase in the number of contractions of the jejunum (see Table 1).

b) Effect of Nux vomica D6 on amplitude and number of contractions of the jejunum

i) Amplitude of contractions

Nux vomica D6 caused a highly significant ($p = 0.0001-0.0245$ Student's t-test) increase in

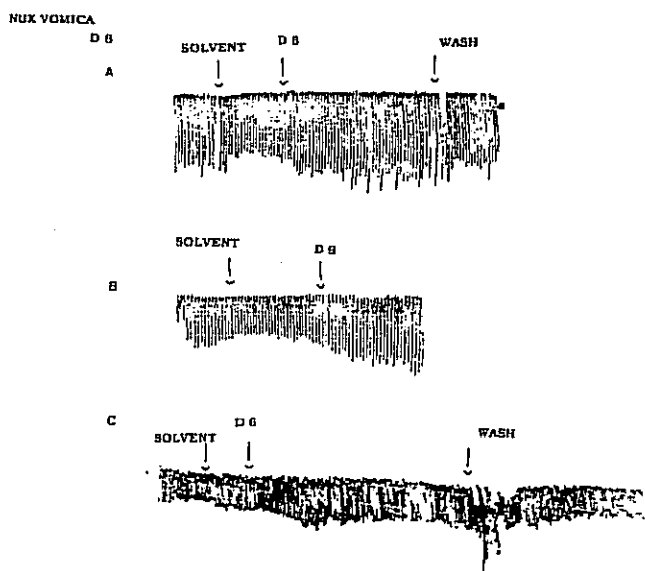


Fig. 1. Effect of Nux vomica D6 on contractions of the jejunum. A, B and C in this and subsequent figures are tracings from separate experiments. The arrows indicate the addition of either solvent, homeopathic preparation or washing of the jejunum, in this and subsequent figures.

the amplitude of contractions in 11 experiments performed (Fig. 1). Comparison of control data and that obtained in treated preparations, using Fisher PLSD and Scheffe F-tests, revealed that there was a significant difference at the 95% significance level. However, in one experiment a significant decrease in the amplitude of contraction was recorded. The overall effect of Nux vomica D6 was a 43.4% increase in amplitude of contraction of the jejunum above controls.

ii) Number of contractions

Administration of Nux vomica D6 failed to cause any significant change in the number of jejunum contractions, in 7 experiments. In one experiment there was a significant ($p = 0.034$, Student's t-test) increase, while in three experiments a significant ($p = 0.0484, 0.04, 0.0364$, Student's t-test) decrease in the number of contractions was recorded. Comparison of the control data and data obtained after administrations was recorded. Comparison of the control data and data obtained after administration of D6, in these 4 experiments was significant at the 95% significance level, using the Fisher PLSD and Scheffe F-test. D6 caused a 4.2% decrease in the mean number of contractions of the jejunum (Table 1).

c) Effect of Nux vomica D10 on amplitude and number of contractions of the jejunum

i) Amplitude of contractions

Administration of Nux vomica D10 caused a highly significant ($p = 0.0001-0.0041$, Student's t-test; Fisher PLSD and Scheffe F-tests at 95% significance level) increase in the amplitude of contractions of the jejunum in all 9 experiments performed (Fig. 2).

The increase in the amplitude of contractions of the jejunum was 65% above controls (Table 1).

ii) Number of contractions

Nux vomica D10 caused a significant ($p = 0.0031$ and 0.0001 , Student's t-test; Fisher PLSD and Scheffe F-tests at 95% significance level) increase in the number of contractions, in 2 experiments. In 7 experiments however, Nux vomica D10 failed to cause any significant change in the number of contractions.

The overall effect of Nux vomica D10 was a 2.2% decrease in the number of contractions of the jejunum (Table 1).

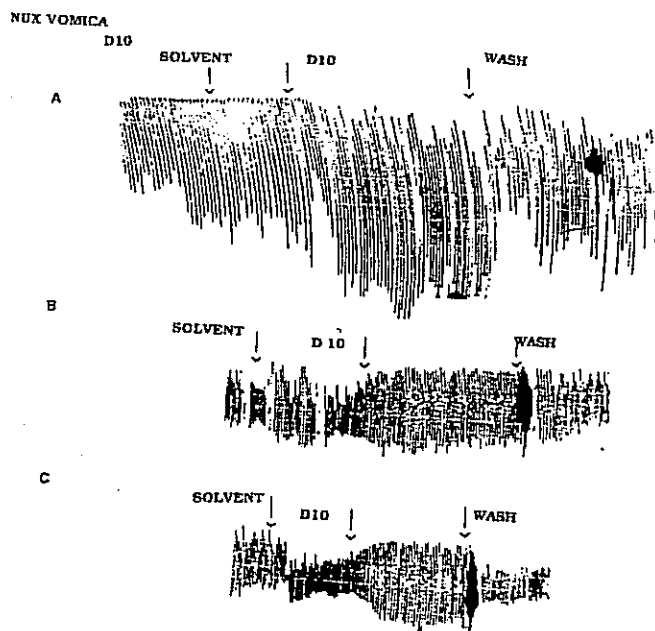


Fig. 2. Effect of Nux vomica D10 on contractions of the jejunum

d) Effects of Nux vomica-Homaccord ad us. vet. on amplitude and number of contractions of the jejunum

i) Amplitude of contractions

Administration of Nux vomica-Homaccord ad us. vet. caused a highly significant ($p = 0.0001$, Student's t-test; Fisher PLSD and Scheffe F-tests significant at 95% level) increase in the amplitude of contractions of the jejunum in all 10 experiments

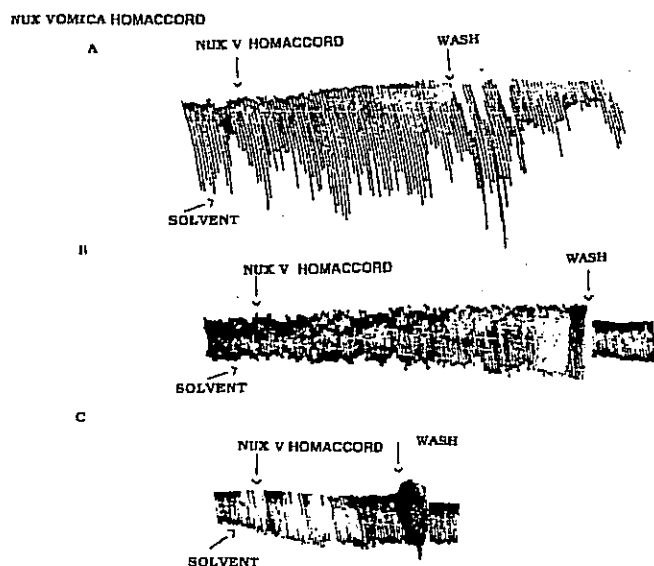


Fig. 3. Effect of Nux vomica-Homaccord ad us. vet. on contractions of the jejunum

performed (Fig. 3). The increase in the amplitude of contraction of the jejunum was 49.3% above controls (Table 1).

ii) Number of contractions

In only 1 experiment was there a significant increase ($p = 0.0005$, Student's t-test; Fisher PLSD and Scheffe F-tests at 95% significance level) in the number of contractions of the jejunum. Nux vomica-Homaccord ad us. vet. failed to cause any significant change in the number of contractions of the jejunum, in the rest of the 9 experiments.

e) Effects of Atropinum compositum ad us. vet. on amplitude and number of contractions of the jejunum

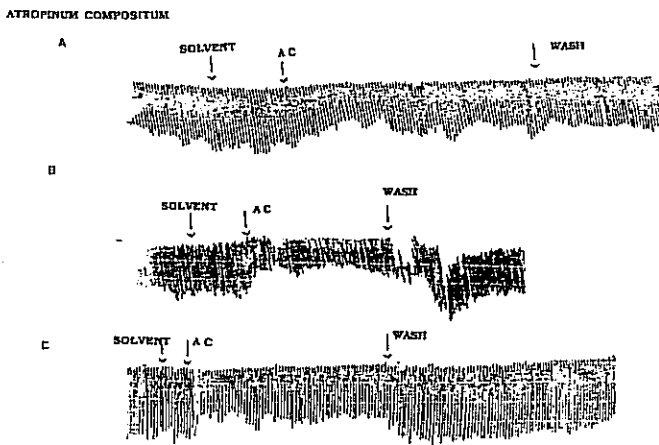


Fig. 4. Effect of Atropinum compositum ad us. vet. on contractions of the jejunum

i) Amplitude of contractions

In all the 10 experiments performed, administration of 10 drops of Atropinum compositum ad us. vet. caused a significant decrease in the amplitude of contraction ($p = 0.0001$, Student's t-test) (Fig. 4). When the data obtained was subjected to the Fisher PLSD and Scheffe F-test, the decrease in amplitude of contractions was significant at the 95% level, when compared to controls. The decrease in amplitude of contraction of the jejunum, caused by the above preparation was 38.4% of controls (Table 1).

ii) Number of contractions

Atropinum compositum ad us. vet. caused a significant decrease ($p = 0.0001$ Student's t-test, and $p < 0.5$ Fisher PLSD and Scheffe F-tests) in the

number of contractions in 5 experiments. In the rest of the 5 experiments no significant change in the number of contractions was found, when the data was evaluated using all the three statistical tests. The mean decrease in the number of contractions was 10% (Table 1).

Discussion

The experiments described demonstrate that ultra low dilutions of *Nux vomica*, *Nux vomica-Homaccord ad us. vet.* and *Atropinum compositum ad us. vet.* have a profound effect on gut motility perhaps via a direct excitatory or inhibitory action on smooth muscle or indirectly via nerve tissue. These experiments therefore support other published results (Fisher et al., 1989; Bildet et al., 1990; Lalanne et al., 1991), that administration of particular substances at ultra low dilutions causes significant effects, such as amelioration of some disease states. The effects of *Nux vomica* in these experiments, were stimulation of contractility of the piece of jejunum used. *Nux vomica* may therefore stimulate appetite via its stimulatory action of gastrointestinal activity. The stimulatory actions of *Nux vomica* may also explain its wide use in empirical medicine, in the amelioration of various gastrointestinal disturbances. On the contrary the effects of *Atropinum compositum ad us. vet.* were inhibitory i.e. relaxation of the jejunum. These inhibitory actions may be exerted either via the smooth muscle or indirectly via the nerve tissue innervation of the jejunum, and may account for the therapeutic actions of this substance in homeopathic medicine.

The concentration of the active principles used was ultra low, and therefore a pharmacological mode of action via drug-receptor interaction can not explain the results obtained. The results were similar to those obtained following administration of well known excitatory (adrenaline) and inhibitory (acetylcholine) pharmacologic agents. The mechanisms of action of the ultra low concentrations of the substances used in this study, like in previous studies (Fisher et al., 1989; Bildet et al., 1990; Lalanne et al., 1991) are unknown. The homeopathic preparations used perhaps exert their actions via electromagnetic forces and or biophotons (Popp et al., 1988; Van Wijk and Schamhart; 1988; Weingärtner, 1990). Thus physico-chemical mechanisms (Poitevin; 1990) rather than pharmacological means may account for the actions of the ultra low preparati-

ons used. This still remains to be firmly established.

It is concluded on the basis of the in vitro results obtained, that administration of ultra low *Nux vomica* as well as *Nux vomica-Homaccord* or *Atropinum compositum* preparations has a profound effect on gut smooth muscle contractility.

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Correspondence:

Prof. Dr. med. vet. H. Enbergs
Institut für Anatomie, Physiologie und Hygiene
der Haustiere
Universität Bonn
Katzenburgweg 7-9
D-53115 Bonn