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COMPARATIVE EFFICACY OF HERBAL COMBINATIONS AGAINST NEMATODES IN SHEEP

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Abstract:
Helminthiasis is a condition which is caused by the nematodes. Nematodes cause decreased food intake and decreased metabolism which causes limited production of the animal. Helminthiasis is a disease of animals caused by gastrointestinal nematodes of sheep and has been found as a major problem to profitable production of ruminants. Different samples of sheep were taken at random from the district Sheikhupura. There were three experimental group 1) Experimental group was given (garlic and Kalonji) 2) Experimental group was given tumma and kalonji 3) Experimental group was given oxafax. All experimental animals were given combinations and fecal sampling was done before and after the treatments to see the effects of combinations. Then the data thus obtained was analyzed statistically under one way ANOVA by using completely randomized design and by SPSS. Change in the EPG gave us the effectiveness of these plant combinations. It can be concluded that herbal combinations are effective against the nematodes. These plants have efficacy for the helminthes. Group A has less effect as compared to the B. They can be replaced with the synthetic chemicals. So we can say that these plants can be used at the lower level of infection. We should use these plants in common practice. We have seen that nematodes are much prevalent in the district. So area is highly affected by the worm load. So we must have to take an action to control these intestinal parasites. Especially grazing animals are more prone to the helminthes. For this, we should use these plants as de-wormers regularly. By this farmer will get easy access to the treatment. Locally used chemicals are much effective than these plants but they are causing immunity in the worms. And their residual effects are also seen in the sheep. So it can be a better option to use these plants as a replacement of the synthetic de-wormers.

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INTRODUCTION:

Helminthiasis is a condition which is caused by the nematodes. Nematodes cause decreased food intake and decreased metabolism which causes limited production of the animal (Waller, 1987). Control of nematodes depends upon chemotherapy (Lloyd Evans, 1991). These chemicals cause development of resistance in the parasites and residual effects of anthelmintics is drastic (Bowman et al., 1999). Despite of this it is expensive. (Al-Shaibani et al, 2009; Bachaya et al, 2009; Deeba et al, 2009; Sindhu et al, 2010). Plants and plant products can be their replacement which are safe in use, cheap in cost and easily available(Zaman et al. 2012).

Different nematodes cause infection in the sheep. A.eslami gave a list of the nematodes of the sheep found in the positive fecal samples. These are some nematodes of the sheep, Haemonchus contortus, Ostertagia trifurcata, Ostertagia circumcincta, Nematodiuris species, Prabronemaa skrjabini, trichostrongylus vitrines, cabertia ovina,Trichuris ovis(Eslami et al. 1979).

Haemonchus contortus is a helminth, it causes a condition in sheep called haemonchosis. It causes decrease in production, weight and growth. Qamar studied about the economic losses due to this condition. There is high mortality rate in the young animals. For this purpose samples were collected from 4 different districts of Pakistan. It showed that there is a loss of 8800.09 million rupees annually. For treatment annually 25 million rupees are lost(Qamar et al. 2011).

The present study was conducted to investigate the prevalence of gastrointestinal parasite of sheep in southern Punjab Pakistan. The prevalence was found to be 46.33%. These helminthes were found in the study Fasciolia hepatica, Avitellina centripunctata, Haemonchus contortus and Trichuris globulosa was 21.41, 12.23, 6.50 and 5.73%, respectively. Prevalence was higher in male than female. Infection was higher in lambs than adults ($P<0.05$). It is concluded that age, sex, body weight and breed are important factors which influence the prevalence of different parasites(Lashari and Tasawar 2011).

There is great economic and production loss due to helminthes. Anthelmintics are the chemicals which are used to control helminthes. This increased use of anthelmintics is causing development of resistance in the helminthes against them. We can avoid this problem of resistance by using plants. Lateef experimented on many plants and gave their efficacy against helminthes(Lateef et al. 2013).

Livestock keepers have a great threat of parasites. Animals can be affected by different types of parasites. Haemonchosis is an important parasitic problem. It can harm to the animals in many ways i.e. by sucking blood, by damaging hides and decreasing the production of animals. Millions of rupees are lost due to haemonchosis. Haemonchosis causes 50% mortality in animals(Qamar et al. 2011).

Plants are being used to cure diseases abundantly since long. Kashmir has many plant species which can be used for this purpose. In this study many plants of Kashmir were used to check their effects in curing their anthelmintic effects against sheep(Tariq and Tantry 2012).

REVIEW OF LITERATURE

Rural populations are mostly dependent on the small ruminants. Mostly animals are fed by extensive system of grazing. By this animals are more prone to get infested with the gastrointestinal parasites. In this study infestation in the animals of Cholistan that is an area of Pakistan was studied. There was a prevalence of 78.1% of helminthes in the 500 samples. In sheep female had much infestation than the male. Sucklers were much affected as compared to the adults(Raza et al. 2014).

A research was conducted in Rawalpindi (Pakistan) on prevalence of endo-parasites in sheep. Total 86 fecal samples of sheep were collected. After examination it was seen that 65.7% were positive. Prevalence was (72%) than. Different parasitic populations were found in the fecal samples(Gadahi et al. 2009).

Another study was conducted on the prevalence of helminthes in Gujrat and Mandi Baha-ud-din Punjab (Pakistan). In samples 91.44% were positive. They were having nematodes trematodes and cestodes. Infestation was maximum from January to September but minimum from October to December. There was a remarkable decrease in the production and growth of positive animals(Khalil-ur-Rehman et al. 2009).

A study was conducted in Greater Cholistan desert of Pakistan on the ethno-veterinary usage of wild medicinal plants from January, 2007 to December, 2008. Information regarding 35 plant species was collected used in diarrhea and dysentery caused due to helminthes. This study indicates the importance of plants against the parasites(Khan 2009).

Baber conducted a study in Bakhar district of Pakistan. Study was based to analyze the botanical importance

of plants as anthelmintics. Total 115 plants were analyzed. Mostly used parts of the plants were leaves, seeds, and seed oils, and fruits. They were given orally as powder or paste or liquid. In result these plants were very effective in many ways especially as anthelmintics(Babar et al. 2012).

Iqbal studied the comparative efficacy of ginger with levamisole in sheep. He used rhizome of ginger. He gave crude powder and crude aqueous extract of dried ginger at the rate of 1-3 g/kg. After treatment a maximum reduction of 25.6% and 66.6 was seen in eggs count in feces at tenth day. Levamisole was given at the rate of 7.5 mg/kg. It gave 99.2% reduction in eggs(Iqbal et al. 2006).

Jabbar studied the use of two plants at the same time as anthelmintic. Haemonchus contortus was helminth against which effect was seen. Plants were used as a whole. Animal used was sheep. Plants were used as crude powder and aqueous methanolic extract at the rate of 1-3g/kg. Both of them had different effects at different times and dose rates(Jabbar et al. 2007).

A.sativum is an important plant which is used in ethno-veterinary medicine. In this study results of A.sativum were compared with the local synthetic anthelmintics. Four groups were made for this purpose and different doses were given in each group. Fifth group was given synthetic anthelmintic. After treatment fecal samples were collected and analyzed by McMaster technique. And results were obtained by comparing eggs per gram before and after the treatment. Reduction in the eggs was seen by the use of A.sativum and it was evident that its effects were near to the synthetic anthelmintic(Masamha et al. 2010).

Parasitic nematodes cause a great economic loss annually. These parasites cause infectious diseases, which retard the growth and cause production loss of the sheep. Control of parasites is done by local synthetic de-wormers. Many plants are being tested to be an alternative of the synthetic medicines and therefore their adverse effects can be hindered. Commonly used plants include Dodoneaangustifolia, Aframomumsanguineum, Myrsineafricana, Hildebrandtiasepalosa, Rapaneamelanophloeos, and Azadirachtaindica. Their effects were seen against Heligmosomoide spolygyrus(Satrija et al. 2001).

To compare the efficacy of natural plants with some commercial anthelmintics, including pyrantel, ivermectin and piperazine, were studied. Pyrantel and ivermectin proved highly effective to reduce the numbers of eggs but piperazine had a lower activity. Use of santonin and M. africana remarkably reduced total worm counts but not fecal egg counts. Use of embelin R. melanophloeos and A.indica. caused reduction in fecal egg count but not total worm count. However, in all cases reductions were noticeably below the priority level of 70% required for biological significance. A. sanguineum, D.angustifolia and H. sepalosa had no effect on either total worm count or fecal egg count. At the end it was concluded that these plants had no anthelmintic effect in these small ruminants. And they were rejected to be the anthelmintic(Githiori et al. 2003).

Nigella sativa which is commonly known as karayal is a flowering plant which grows round the year. In present paper multiple uses of these plants are seen as remedies, medicinal importance, pharmacological and traditional value. This paper indicates the importance of Nigella sativa to help the researchers to set their minds for approaching the ability, utility, efficacy and potency of this plant(Sharma et al. 2009).

Anthelmintic activity of Fumaria parviflora was investigated against the parasites of sheep especially gastrointestinal nematodes. By in-vivo studies it was revealed that those experimental groups treated with the doses of 200 mg/kg of aqueous or ethanolic extracts of F. parviflora showed higher ($p<0.05$) reduction rate when they were observed in fecal egg counts as compared to those un-treated groups which were negative control. Maximum reduction observed was 77.6 and 70.05% by using ethanolic and aqous extract respectively at a dose rate 200 mg/kg and it was seen 14 days after the treatment. This study showed that F. parviflora whole plant extracts has anthelmintic activity, so we can use it in traditional veterinary practices(Al-Shaibani et al. 2009).

The experiment was conducted to study the effects of garlic (Allium sativum, @100mg/kg body weight.) turmeric (Curcuma longa) and betel leaf (Piper beetle) for a period of 28 days to study the effects against the nematodes. Water extract of bulbs of garlic were given orally to the animals of group A. Water extract of rhizome of turmeric were given orally to the group B. Leaves of betel leaf were given orally to the group C. Group D was kept as infected control group. Before and after the treatment fecal samples were checked, A proper change of ($p < 0.01$) was seen and a reduction of ($p < 0.01$) in Eggs Per Gram count was there found after giving garlic (20.41-40.81%), with turmeric (6.09-19.27%) and with betel leaf (2.91-9.8%). In control group D there was a prominent increase was there when EPG was calculated. By this study it was

seen that garlic was effective to some extent but turmeric and betel leaf were less effective against gastrointestinal nematodes(Amin et al. 2008).

A number of anthelmintics are used against the helminthes to overcome the problem. But development of resistance in the parasites is a challenging issue to the animal care professionals Therefore it is the area of interest to exploit the potential of plants indigenous to indo-pak against the parasites. In this paper we will focus on the use of different plants(Akhtar et al. 2000).

Main purpose of this study is to look at the anthelmintic activity of plants of indo-pak origin against the helminths. Five different plants Nigella sativa Linn, Areca catechu, Tamarindus indica Linn, Daucuscaro ta L. Ocimumtenuiflorum with different concentrations of 25, 50, 100 mg/mL were used and the plants were used as extracts diluted with 3% between 80 in normal saline for the anthelmintic activity. To compare albendazole was given. A study was conducted on larva and effects were to observe in-vitro and effects was calculated time in minutes and death rate. And the effects of all the plants ethanolic extracts from all parts of the plants at a concentration above 100mg/mL except inhibition in the daucuscarota showed a significant effect(Goswami et al. 2016).

Plants secondary metabolites were analyzed against the helminthes. It is evident that plants secondary metabolites have anti-parasitic effects but it depends on the level of ingestion and the structure of the plants secondary metabolites. It is assessed that they are importantly useable but their anti-nutritional effects may cause an increase in cost. At the end it is seen that their use is advisable in practice because their harms are least and short term but benefits are long term and more(Athanasiadou and Kyriazakis 2004).
It is seen that we can use plants as anthelmintic and can control the parasites. In this study it was noticed that which components can be used? For this in-vitro and in-vivo studies were done. With this other factors were also studied. Studies were done on sheep(Oliveira 2012).

Tenin containing plants were tested to analyze their effects against helminthes. For this purpose two groups were made. Qubracho plants were used on the basis of dry matter for 8 days in one group. Other group was kept as negative control. After the treatment ewes were slaughtered and samples were taken from abomasum. It was clear that there was a prominent decrease in the worms in the treatment group(Hoste and Torres-Acosta 2011; Paolini et al. 2003).
In this study plants were studied as anthelmintic so that they can help in reduction of the cost required in the treatment against helminthes. Different plants were selected and their different doses were used and appropriate dose was calculated. Many plants were selected as a source of herbal treatment including Carica papaya, Morinda citrifolia, Ananas comosus, Coleus blumei, Codiaceum variegatum and Leucana leucocephala. Some of the plants were proved very effective and hence it was concluded that plants could be an alternative source of synthetic anthelmintics(Satrija et al. 2001).

Efficacy of garlic was studied against the Haemonchus contortus and coccidia. Animal selected was sheep. For this 4 groups were made one was control and other three were given different doses of garlic. Results indicated that it was much effective against the coccidia than haemonchus. By increasing the dose efficacy increased(Worku et al. 2009).
K. senegalensistowards was studied for its anthelmintic effects. Effects were studied for the larvae of strongyles. Oral efficacy was studied at different doses. K. senegalensis extracts in the cultures decreased the viability of larvae. The aqueous extract (0.69 mg/ml) is not significantly different ($P > 0.05$, t-test) from the ethanolic extract (0.51 mg/ml). The activity of the extract is concentration dependent in vivo. The extract of K. senegalensis could find application in anthelmintic therapy in veterinary practice.(Ademola et al. 2004)

In this study resistance in the worms was studied caused by the anthelmintics. Its major reason is the extensive use of the drenches. Resistance to the Benzimidazole and Levamisole was basically studied in this study. The organophosphate naphthalophos, are studied to replace these chemicals. So that we can have a safe and effective way to control the worms..(Besier and Love 2003)
Prevalence was studied for the different species of abomasal nematods. A prevalence of 91.2% was seen for Haemonchus species. Likewise, an prevalence of 37.7% Trichostrongylus axei was recorded in sheep. Statistically significant ($p < 0.05$) difference in prevalence and average worm burden was noted between months of study for abomasal nematodes(Kumsa and Wossene 2007).

Efficacy of cysteine proteinases from papaya, pineapple, fig, kiwi fruit and Egyptian milkweed was studied against the nematode. These plants enzymes proved to be active against the protective cuticle of the

worms which suggests that there will be slow resistance against them. The efficacy and mode of action of these plants show that they can beeffective as anthelmintic for the treatment of domestic livestock.(Stepek et al. 2005)

Resistance against the benzimidazoles, imidazothiazoles and macrocyclic lactones has become a global phenomenon. In this report the discovery of the amino-acetonitrile derivatives as an anthelmintic is explained. Amino-acetonitrile derivatives are easily tolerated and have no toxicity to mammals, There is lest level of resistance against them(Kaminsky et al. 2008).

STATEMENT OF PROBLEM:

Livestock is the backbone of agricultural system of Pakistan. In rural areas many small holding families are totally dependent on their animals to feed the whole family. Most of the animals have extensive system of grazing and they are more prone to the infestation with the parasites. Invasion of parasites cause reduction in production of animal, retardation of growth and increase in the treatment cost. Parasitic invasion may also cause mortality. So we need a control system that can reduce this parasitic load. Control of these parasites should be cheap and easily accessible. But locally used drugs are expensive and have other problems like toxicity and development of resistance. For this purpose there should be an alternative that would be cheap in cost and easily available. It may also be safe in use and may not cause toxicity. Which plants can be used for the anthelmintic activity is another important question. So we can use different plant combinations in different doses.

Objectives

- Prevalence of nematodes in small ruminants in District Sheikupura.
- To compare the efficacy of different herbal combinations.

MATERIALS AND METHODS:

3.1 Prevalence:

First objective of the study was to see the prevalence of the nematodes in the District Sheihkupura. For this purpose record of fecal samples was collected from the government and private hospitals of the Sheikhupura. Animals of the whole district are brought every Saturday to the animal market. So, some fecal samples were also collected from there. Record of the fecal samples collected was from May 2017 to the April 2018. Fecal samples collected were analyzed for nematodes. A record was maintained for the positive fecal samples for nematodes. Total population of the sheep in the district Sheikhupura is 109,019. In district there are five tehsils. Each tehsil has animal population as Ferozwala 18,526, Sharaqpur 16,891, Mureedky 23914, Sheikhupura 38,773, Safdarabad 10925. Animals that were brought to the hospitals and veterinary dispensaries each month round the year were as, given in the table below.

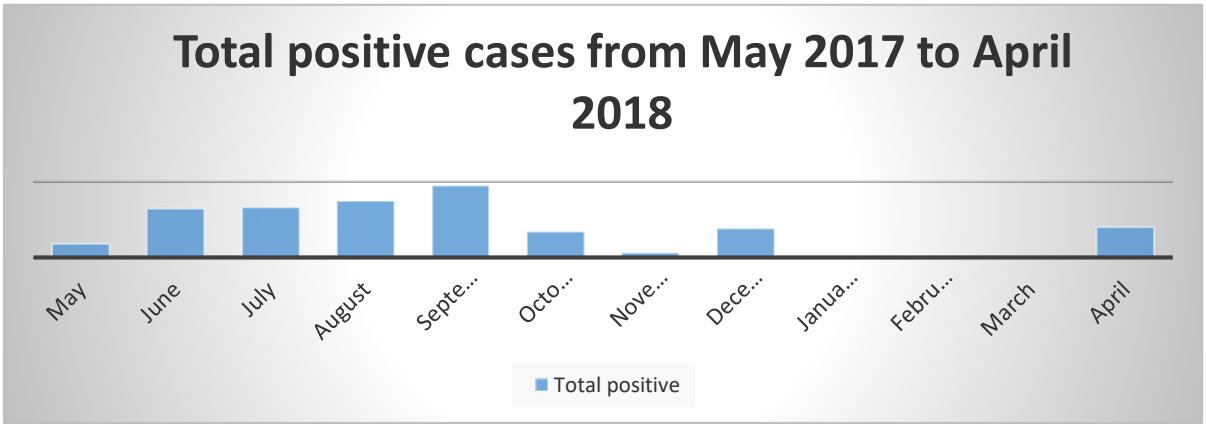
Table 3.1 Prevalence of nematodes from May 2017 to April 2018

Total Animals Visited	Positive for Nematodes
5740	2180

Prevalence was calculated as total no of positive cases by total population:

Prevalence = Total morbidity / Total Population * 100 %

Prevalence = 37.97 %



3.2 Research Design:

Second objective was to test the herbal activity against nematodes. For this purpose fecal samples of the sheep were collected from the District Sheikhupura.

3.3 Experimental Design:

In first step total 15 fecal samples were selected and found positive from the area of Sheikhupura. The animals were randomly divided in to 3 groups, with 3 replicate treatments. In each group 5 animals were kept. In one treatment group Tumma (citrulus colocynthis) and kalonji (Nigella sativa) were given. In second group garlic (Alium sativum) and kalonji (Nigella sativa), were given. In third group oxafax was given. All the animals were belonging to the local farmers and they were grazed in the fields. All the groups had same chances of getting infection. All of the treatments were checked for their efficacy in the same field conditions. Fecal samples of animals were taken before and after the treatment. Animals were tagged on sampling. Efficacy was checked against the locally used chemicals and herbal combinations. Sheep were firstly selected as positive and their samples were taken. Sheep having an egg count more than 1000 were selected and three groups were made.

Table 3.2 Experimental design

Group	Number of Animals	Treatments
A	5	Garlic and Kalonji (10ml of garlic extract + 3g/kg of kalonji powder per animal(
B	5	Tuma and Kalonji (50mg per animal tuma seeds ground + 3mg/kg of kalonji powder per animal)
C	5	Oxafax (10 ml per animal)

3.4 Experiment:

Fecal samples were collected by random sampling technique and further processed and analyzed at Medicine laboratory of University of Veterinary and Animal Sciences Lahore. Total 45 fecal samples of sheep were collected. Out of 45, 30 were found positive. Out of 30 positive samples 15 fecal samples having an EPG above 1000 were further selected for processing. Animals were divided into 3 groups each containing 5 animals. At the day zero selected animals were given treatment. Then sampling was done again on 7th day and 15th day. By this we could compare the EPG before and after the treatment.

3.5 Transport of sample:

Fecal samples were kept in plastic containers which were having air tight covers to avoid contaminations. Fecal samples were brought to the laboratory at University of Veterinary and Animal Sciences Lahore and were tested for EPG of fecal samples. Samples were transported by maintaining cold chain.

3.6 Fecal Samples Processing:

Fecal samples were assessed qualitatively and quantitatively. Qualitative measurements were done by direct slide method and floatation technique. McMaster Technique was used for quantitative measurement, against each individual.

3.6 (a) Qualitative Method:

In qualitative method we can access the fecal samples by (1) direct slide method and (2) floatation method.

(1) Direct slide method

In direct slide method a pinch of fecal sample was put on the slide and a drop of water was poured on it. After making a complete suspension of the fecal sample debris was removed and clear suspension was made on the slide. After that slide was seen under the microscope and fecal samples were declared as positive or negative for helminthes (Soulsby, 1982).

(2) **Floatation technique**:

Fecal samples were collected from the rectum of the sheep and were labeled according to their tag numbers. After that they were transported to the laboratory at Medicine department of University of Veterinary and Animal Sciences Lahore. A sample of 3 gram was weighed and put into the beaker. After that put 50 ml of the floatation fluid and was mixed properly by stirring. Now pour this solution to the second beaker by screening it through a tea strainer. After that, this solution was put to the test tube up to the top of the test tube. A cover slip that was touching to the fluid was kept at the top of the test tube. For 20 minutes test tube was kept in test tube rack. After that it was gently took off and was seen under microscope (MAFF, 1979).

3.6 (b) Quantitative Method:

McMaster Technique:

The McMaster technique was used for demonstrating and counting helminth eggs in fecal samples. In McMaster technique in counting chamber a volume of fecal suspension (2 x 0.15 ml) was examined microscopically. The McMaster chamber had two compartments, each with a grid etched onto the upper surface. When filled with a suspension of feces in flotation fluid, much of the debris was sunk while eggs float to the surface(Chaudary et al. 2007).

Procedure:

A 4 grams sample of feces was weighed and placed into a container, Then 56 ml of flotation fluid was added to a beaker then fecal sample was added. By stirring the contents of the beaker thoroughly material was mixed. Fecal material was then filtered into the second container. Using the pipette a sub-sample was drawn out. Then this beaker was kept for 30 minutes after that by using pipette first compartment of the McMaster counting chamber was filled with the sub sample. After that other chamber was also filled and was allowed for 5 minutes on the stage of microscope so that all the eggs could be settled. Then samples were examined under the microscope 10 x 10 magnification. All eggs were examined on the engraved area of both chambers. Eggs were counted within the grid of each chamber, ignoring those outside the squares. Total was multiplied by 50 – that gave the eggs per gram of feces (e.p.g.)

Eggs per Gram

EPG =Eggs in right chamber + Eggs in left chamber × 50

We can compare the activity of each group of plants by comparing the number of eggs before and after the treatment. The formula is eggs count reduction(MAFF,1979).

% ECR Pre-treatment egg count per gram Post-treatment egg count per gram Pre-treatment egg count per gram = − − × 100

Figure 3.2.1 Preparation of fecal samples.

Figure 3.2.2 Filling of McMaster slide.

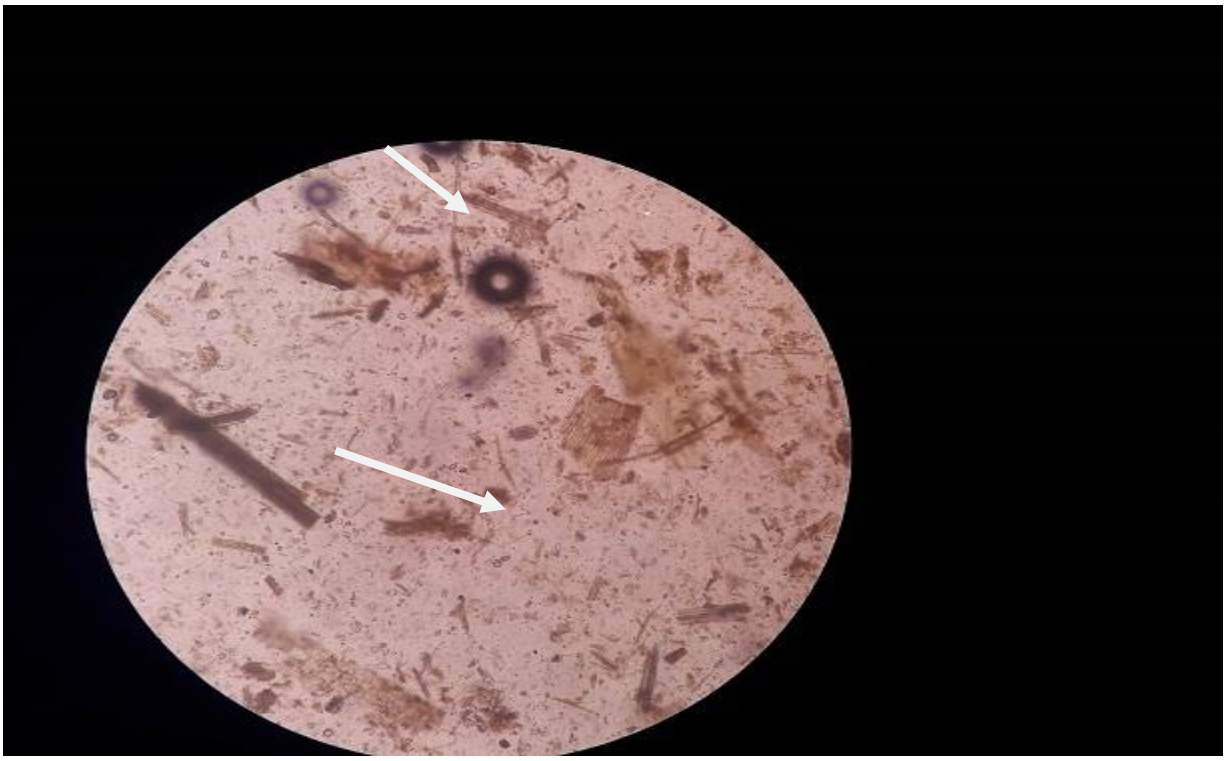


Figure 3.2.4 Egg of Haemonchus contortus.

3.7 Collection of Ingredients:
Tumma (citrulus colocynthis) and kalonji (Nigella sativa) and garlic (Alium sativum) were brought from the local market. Tumma was in dry form and was ground as a whole having its seeds. Kalonji and garlic were also ground. Combinations were made as given in the table below.

3.8 Dose Rate:
All of the ingredients were measured according to the table 3.2 and combinations were made to give the sheep.

Table 3.3 Composition of treatment groups:

Group	Combinations	Dose
Group A	Garlic and Kalonji	Combination of 10ml of garlic extract + 3g/kg of kalonji powder per animal
Group B	Tuma and Kalonji	Combination of 50mg per animal tuma seeds ground + 3mg/kg of kalonji powder per animal
Group C	Oxafax	10 ml per animal

3.9 Statistical analysis:
The collected data was analyzed by one way ANOVA.

RESULTS:

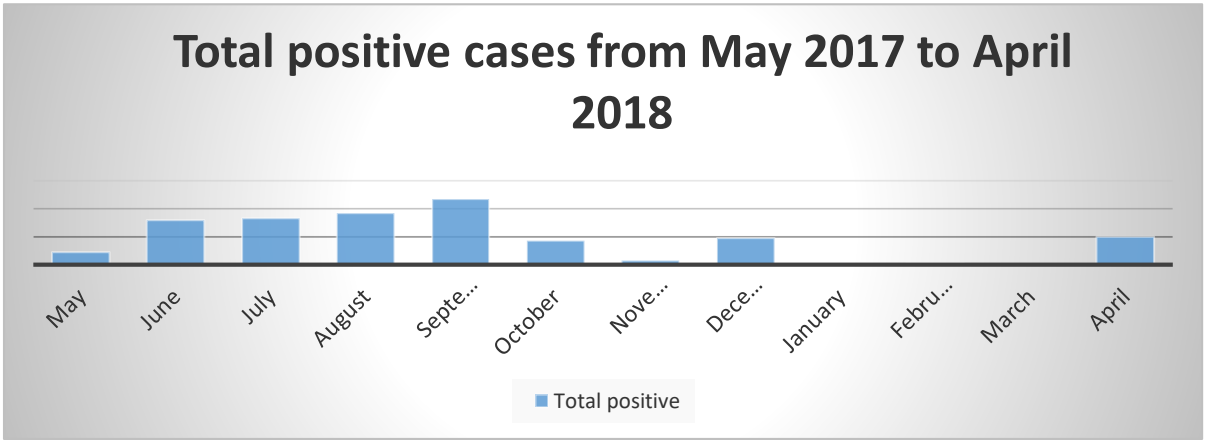
Table 4.1 Prevalence of nematodes from May 2017 to April 2018

Total Animals Visited	Positive for Nematodes
5740	2180

Prevalence was calculated as total no of positive cases by total population:

Prevalence = Total morbidity / Total Population * 100 %

Prevalence = 37.97 %



EPG Results:

The results indicated that on the day zero day there was an EPG value of higher value. Then treatment was given and their results were seen. It is clear from the table that there is a difference before and after the treatment. Most of the eggs found were of Ostertagia circumcincta, Bunostomum trigonocephalum, Nematodiuris spathiger, Trichuris globulosa, Trichostrongylus, Moniezia expansa and Haemonchus contortus. At day 0, EPG value for each group was 1710±397.492[a] for group A, 1670±345.688[a] for Group B, 1630±544.977[a] for Group C. At 7th day EPG value for each group is as, 510±89.44[a] for group A, 250±100[b] for group B, 120±75.82[b] for group C. Similarly at 15th day EPG value for each group was 390±89.44[a] for group A, 250±93.54[ab] for Group B, 120±83.66[b] for Group C,

Table.4.1 Data of each group expressing reduction in EPG between groups

Group	Epg0	Epg7	Epg15
A	1710±397.492[a]	510±89.44[a]	390±89.44[a]
B	1670±345.688[a]	250±100[b]	250±93.54[ab]
C	1630±544.977[a]	120±75.82[b]	120±83.66[b]

Values with no common superscript differ significantly within columns at P<0.05.

And it is clear that group A, B, C had an EPG value in the same range on day zero. On 7th day group B and C have almost the same results but group A has a different value. On 15th day values for group B and C are same and at the same time values for group A and B are same. While looking in the column after the treatment there is a significant change in EPG of group and then in the group A and B. No significant change is seen in the control group.

DISCUSSION:

This study was carried out in the Potohar area of northern Punjab, Pakistan from December 2004 to January 2006. Prevalence of the Haemonchus contortus in sheep was studied according to the season. Faecal samples collected were examined by the McMaster technique using saturated solution of sodium chloride. The peak infection level was recorded during rainy season (July-October). On the other hand, low infection level was noted from December upto May. Highest fecal egg count was recorded in Islamabad, followed by Attock, Jhelum and Chakwal.. High prevalence of H. contortus in Potohar areas was due to favorable agro-climatic conditions that favors the development and survival of the free-living stages of H. contortus(Chaudary et al. 2007).

Above mentioned study reveals that high prevalence of the nematodes is there in different areas of the Pakistan. So there is a need that we may control them. So we can avoid the harms caused by these parasites to the sheep. For that would have to adopt the deworming schedules according to the season. Seasonal effect shows the crucial time for the deworming of the animals.

Different reports reveal that there is development of resistance in the helminthes against the anthelmintic. Small ruminant industry is highly affected by this problem of resistance. but. There is an urgent need to develop both novel non-chemical approaches for parasite control and molecular assays capable of detecting resistant worms(Kaplan 2004).

Above mentioned study reveals that there is high level of resistance against the anthelmintic. We need to produce an alternative to these synthetic drugs, In the present study we have used parts of the plants which are least toxic to the animals. They are least resistant by the helminthes. They are cheap in cost and easily accessible. So in result we can adopt them as anthelmintic.

There is no effective alternative to chemical control of parasitic helminthes in grazing system. Resistance to anthelmintic is a major problem in veterinary medicine. It threatens both agricultural income and animal welfare. Basis of this resistance is not well understood. So we cannot find the root of the resistance in the helminthes. It would be possible in future. In this study mechanism of resistance is summarized(Wolstenholme et al. 2004).

We can say that there must be an alternative source of the chemical drugs. So we will be able to control the problem of residual effects in the animals. We will also be able to control the problem of resistance and hence we can control the parasites in time, in least price and safer way.

SUMMARY:

Helminthiasis is a disease of animals caused by gastrointestinal nematodes of sheep and has been found as a major problem to profitable production of ruminants. Different chemicals are used to control these helminthes. But hey cause some problems. Firstly they are expensive for the farmers. Secondly they cause development of resistance in the helminthes. Thirdly sheep in which these chemicals

had been used would have residual effects. To avoid these problems of synthetic chemicals, many trials are in progress all over the world. An important and safe alternative to these drugs is the plants. Various herbal combinations have been used in different areas of the world so that we can replace the locally used chemical combinations with the herbal combinations which are cheaper and have least toxic effects to control nematodes and helminthes. Plants have been used from ancient times to cure diseases of man and animals. This system of therapy is commonly referred as "unani, folk, eastern or indigenous" medicine. As economics matters a lot this way will help us to reduce the burden by giving farmer a cheaper source. Many plants have been used in different areas of the world and Pakistan too, against different larval stages and eggs in-vitro and in-vivo. For this purpose this study was conducted to see the effect of some plants against nematodes.

Dofferent samples of sheep were taken at random from the district Sheikhupura. There were three experimental group 1) Experimental group was given (garlic and Kalonji) 2) Experimental was given tumma and kalonji 3) Experimental group was given oxafax. All experimental animals were given combinations and fecal sampling was done before and after the treatments to see the effects of combinations. Then the data thus obtained was analyzed statistically under one way ANOVA by using completely randomized design and by SPSS. Change in the EPG gave us the effectiveness of these plant combinations.

CONCLUSION:

It can be concluded that herbal combinations are effective against the nematodes. These plants have efficacy for the helminthes. They can be replaced with the synthetic chemicals. So we can say that they plants can be used at the lower level of infection. We should use these plants in common practice. By this study we have found that sheep are highly affected by the nematodes. Especially grazing animals are more prone to the helminthes. For this we should use these plants as dewormers regularly. By this farmer will get easy access to the treatment. It will also be cheap for him and safe in use.

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