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Farmers compliance with ethnoveterinary practices and its impact on desi chicken farming in pudukkottai district of Tamil Nadu

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Abstract

A survey was conducted in Pudukkottai District of Tamil Nadu to observe the ethnoveterinary practices followed by farmers and their impact on desi chicken farming. A total of fifty poultry farmers were interviewed regarding the ethnoveterinary practices in desichicken farming with the well-structured interview questionnaire comprised of general profile, desichicken farming status, ethnoveterinary practices followed by respondents, its impact and the constraints. The immunomodulatory effect of herbs such as *Andrographis paniculata*, *Phyllanthus amarus*, *Ocimum sanctum*, *Azhardicta indica* and *Moringa oleifera* were assessed against Ranikhet Disease (RD) in desichicken birds. Six desichicken farms were selected in the age group of 2-3 months old containing fifty birds in each farm. The treatment groups comprises of T₁ - control (no treatment), *Andrographis paniculata*, *Phyllanthus amarus*, *Ocimum sanctum*, *Azhardirecta indica* and *Moringa oleifera* leaves each one per cent was fed to birds as T₂, T₃, T₄, T₅ and T₆, respectively. In each treatment group blood samples were taken through filter paper technique at the 0 day and 21 days after treatment. From this study, the results showed that 86.0 percent of farmers in pudukkottai district were practicing ethnoveterinary practice and 78 per cent farmers considered RD occurrence in desichicken as a major problem. The antibody (HI) titre against RD in desichicken showed non-significant but, numerically difference among the herb treated groups while *A. indica* group had higher titre value as compared to other treatment groups. Among the 86 per cent of the ethnoveterinary practicing respondents, 80.0 per cent of the respondents had an affinity towards readymade preparation.

Keywords: *A. paniculata*, *A. indica*, ethnoveterinary practices, *P amarus*, *M oleifera*, *O. sanctum*

Introduction

All over the world, ethnoveterinary practices within the ethnic groups and cultural societies are an integral component of livestock healthcare and management practices. In most rural areas people treat their animals with indigenous preparations. At present over 35,000 plants are known to have healing properties. Ethnoveterinary practices are often cheap, safe, time tested and based on local resources and strengths. These can provide useful alternatives for conventional animal health care.

Ethnoveterinary practices were exclusively depended upon few practitioners within communities and it is not such a common knowledge for everybody. In most of the period and communities the ethnoveterinary knowledge, which has been transferred verbally from one generation to the next from immemorial time, is currently in a danger of being lost whenever a traditional veterinary practitioner passes away without conveying his traditional medicinal plants knowledge (Chaachouay *et al.*, 2022) ^[7].

Ethnoveterinary practices are diminishing slowly due to rapid urbanization, decreased interest among traditional healers with the advent of swift progress of conventional medicine and intensive rearing of poultry as an enterprise rather than as a backyard farm. Farmers use different herbal plants for preventing poultry diseases. Aloe is a widely used herbal plant by the farmers which is a traditional and popular practice (Rajiur Rahman, 2012) ^[17].

Newcastle disease is one of the most important viral diseases in chickens throughout the world and has a devastating effect on poultry production in most countries (Alexander, 2001) ^[3].

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Ethnoveterinary practices

Ethnoveterinary practices almost offer viable alternative or compliments to conventional medicine. Ethnoveterinary remedies are quite accessible, easy to prepare and administer, cost effective which is at little cost or no cost to the farmer. Ethnoveterinary medicine not only differs from place to place and but also among and within communities (Balaji NS and Chakravarthi PV, 2010) [20]. Documentation of the indigenous knowledge is important for conservation and efficient utilization of biological resources.

Andrographis paniculata

Andrographis paniculata (Kalmegh) is commonly known as “king of bitters” which belongs to family Acanthaceae. It is small annual herb distributed in tropical asia. It possess cold property and thus used for treatments in conditions such as fevers, to dispel toxins from the body, gastrointestinal tract and upper respiratory infections, herpes, sore throat, hepatitis and a variety of other chronic and infectious diseases. It exhibits antibacterial, antimalarial, filaricidal, antidiarrhoeal, cardiovascular activities, fertility effects and protection of liver and gallbladder.

The herb and its isolates like andrographolide, neoandrographolide, dehydroandrographolide, isoandrographolide, etc. were reported to possess anti-inflammatory, hepatoprotective, astringent, anodyne, tonic, alexipharmic and anti-pyretic properties and helps in arresting dysentery, cholera, diabetes, influenza, bronchitis, swellings and itches, piles and gonorrhea (Prajapati *et al.* 2003) [15].

Phyllanthus amarus

The *Phyllanthus amarus* belongs to the family Euphorbiaceae. It is commonly called as “carry me seed, stone breaker, wind breaker, gulf leaf flower or gala of wind”. It is widely distributed small erect tropical annual herb and the plant is bitter, astringent, cooling, diuretic, astringent, stomachic, febrifugic and antiseptic. It is used for its hepatoprotective, antidiabetic, antitumor, antihypertensive, analgesic, anti-inflammatory, antiviral and antimicrobial properties. The plant is used in jaundice, diarrhoea, dysentery, intermittent fevers and disease of uro-genital system, scabies, ulcers, wounds and cold and it has a good antiviral property against Hepatitis B virus (Joseph and Raj, 2011) [11].

Azadirachta indica

Neem is the traditional medicinal plant widely used in the Indian subcontinent. It belongs to the family of Meliaceae (mahogany family). All parts of the tree are used. More than 135 compounds have been isolated from the different parts of the plant. The compounds have been divided into major classes such as isoterpenoids and others. Nimbidin is the major bitter component of seed kernels oil of *A. indica*. The Biological activity of neem plant is anti-inflammatory, antipyretic, hypoglycaemic, antifungal, antibacterial, immunomodulatory, Spermicidal and antitumor activity.

Ocimum sanctum

Commonly known as “holy basil or tulasi” and belongs to the family *Labiatae*. The plant is known to possess antibacterial activity, antianaphylactic activity, antihistaminic and mast cell stabilisation activity, wound healing effect, radio protective effect, antidiabetic, antioxidant activity, neuroprotective effect, immunologic effect, larvicidal property, anti-genotoxic effect and cardio protective effect. The wide range of chemical compounds present in the plant are eugenol, euginal,

urosolic acid, carvacrol, linalool, limatrol, caryophyllene, methyl carvicol, anthocyanins, etc. (Rahman *et al.*, 2011) [16].

Moringa oleifera

Moringa oleifera is a deciduous tree belongs to the family *Moringaceae*. It is one of the richest plant sources of Vitamins A, B, C, D, E and K. The vital minerals present in *Moringa* include Calcium, Copper, Iron, Potassium, Magnesium, Manganese and Zinc. It has more than 40 natural anti-oxidants. *Moringa* provides a rich and rare combination of nutrients, amino acids, antioxidants, antiaging and anti-inflammatory properties used for nutrition and healing. *Moringa* is sometimes called “Mother's Best Friend” and “Miracle Tree.” (Mahmood *et al.*, 2010) [12]. Phyto chemicals such as alkaloids, tannins, flavonoids, terpenoids, saponin and glycoside were observed. (Vinoth *et al.*, 2012) [21].

Newcastle disease

Newcastle disease (ND) also known as Ranikhet disease (RD) is a highly contagious viral disease and is one of the major viral diseases of poultry causing great economic losses to the poultry industry. The causal agent is the Newcastle disease virus (NDV) which is a negative-sense single-stranded RNA virus belonging to the family *Paramyxoviridae*. NDV strains have been divided into eight genotypes (Ballagi *et al.*, 1996) [5]. The strains are also classified into highly virulent (velogenic), intermediate (mesogenic) or avirulent (lentogenic) based on their pathogenicity in chickens. The disease causes high economic losses due to high mortality, morbidity, stress, decreased egg production and hatchability (Alexander, 2000) [2].

The aim of the present study was to document the ethnoveterinary practices followed by farmers in Pudukkottai district with respect to desichicken farming and to assess the immunomodulatory effect of certain herbs such as *A. paniculata*, *P. amarus*, *O. sanctum*, *A. indica* and *M. oleifera* against RD.

Materials and Methods

Data collection through Questionnaire

The study was conducted at Pudukkottai district in Tamil Nadu state, India. A total of fifty (N=50) farmers were selected for the study. Data were collected with the help of a well-structured interview questionnaire comprised of general profile, desichicken farming status, ethnoveterinary practices followed by respondents, its impact and the constraints.



Selection of farm

Six desichicken farms at Pudukkottai district mainly comprising of Aseel birds and other local breed which was well structured and organized were selected for the study.

Experimental Bird

The desichicken birds selected were in the age group of 2-3 months of age. They were properly vaccinated against RD with LaSota Strain of NDV during 28-30th day of age. The birds were treated with individual herb in each farm.

Herbs for treatment

Fresh Leaves of herbs were plucked, mashed and then coated with turmeric was administered orally individually or mixed in feed to the desichicken birds at the dose rate of one percent each.

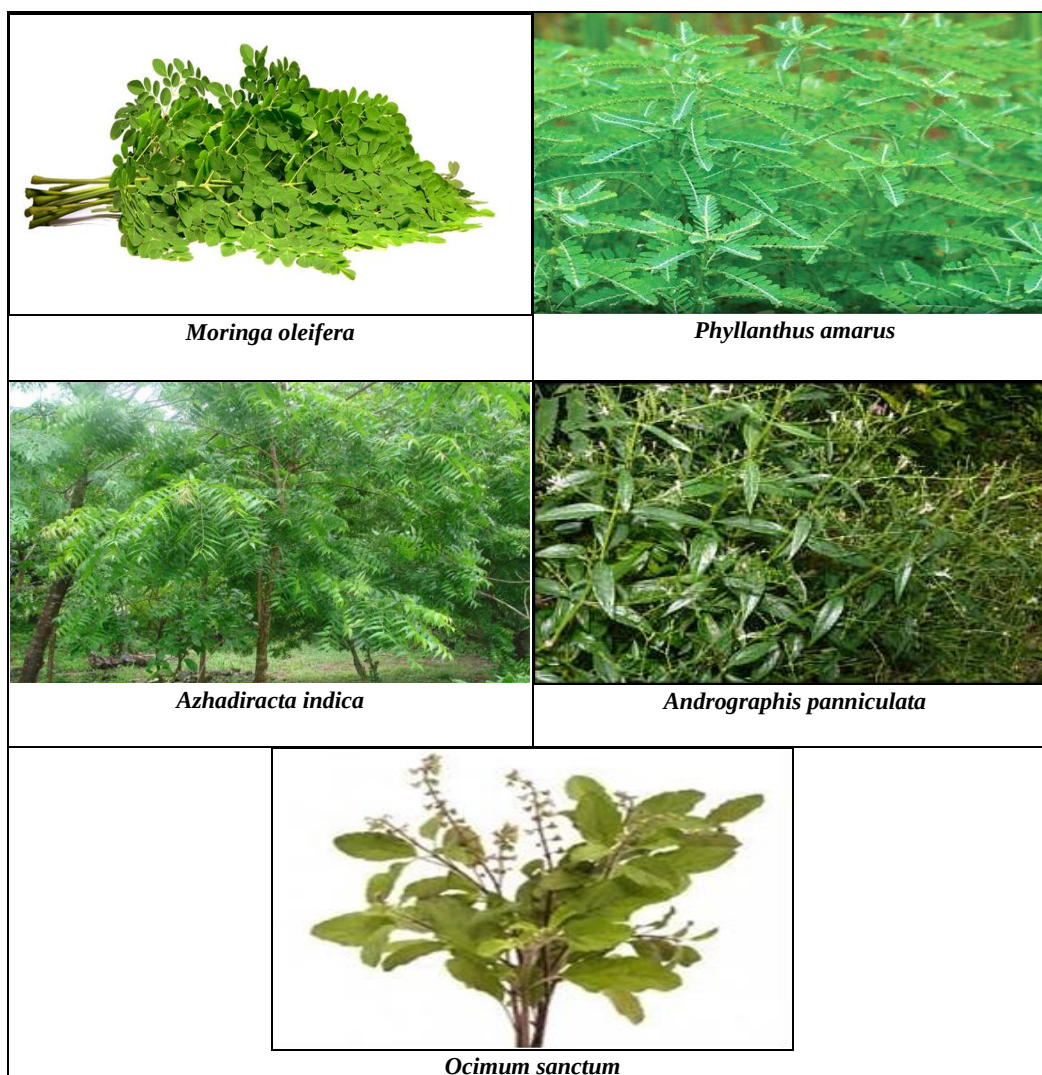
Assessment of Antibody titre

In each treatment group blood samples were collected randomly in filter paper on 0th day (before treatment) and on

21st day (after treatment) to assess the antibody titre against the RD. A modified filter paper technique was used to perform Haemagglutination Inhibition test (Roy *et al.*, 1992)^[18]. This test was conducted at Poultry disease diagnostic laboratory, Namakkal.

Statistical analysis

All the data obtained in this study on various parameters were subjected to statistical analyses as per the methods suggested by Snedecor and Cochran (1994). All data were analyzed by ANOVA and the mean of different experimental groups were tested for statistical significance by Duncan's multiple range test. The analysis was carried out by IBM SPSS (20.0). Angular transformation was applied to percentages wherever needed.



Results and Discussion

In this study, the farmers view with respect to ethnoveterinary practices were presented in the Table 1. In this study, it was found that 86.0 per cent of farmers were adopting ethnoveterinary practices in desichicken farming while the rest of 14.0 per cent rely only upon modern veterinary medicine. In the present study, 60.0 per cent of farmers rearing desichicken in Pudukkottai district were following the recipe against RD recommended by the TANUVAS. The result of the study showed that 40.0 per cent of farmers were using different ethnoveterinary practices against RD. From this study, it was observed that occurrence of RD (78.0 per cent) is of major concern among farmers as when compared to

Fowl pox and other diseases (16.0 and 6.0 per cent) respectively. The survey results also revealed that the 80.0 per cent of desichicken rearing farmers who are practicing ethnoveterinary practices had an affinity towards readymade preparation. Shanthivimalarani and Pavadai (2014)^[19] reported that the ethno veterinary survey conducted among local herbalists, healers, farmers and local leaders at kolli hills, Namakkal District, Tamil Nadu state, India were interviewed for responses regarding traditional Knowledge and found out that a total of 52 plant species were used to cure 36 different conditions of livestock and poultry as a single plant or in combination of plants. Likewise, Moreki JC, (2013)^[14] reported that sixty-six per cent of the respondents

used traditional remedies to control and treat diseases, 19 per cent did not use vaccine or remedies, 2 per cent use vaccine to control diseases while 13 per cent used drugs. Nineteen plant species representing 15 families were used by family poultry rearers to treat and control poultry diseases and parasites.

Similarly, Gueye EF, (1999) ^[10] reported that survey among farmers of some regions of Africa revealed that various diseases were associated with poultry and revealed that ND was the most widely spreaded disease and major economic loss is associated with diseases of poultry.

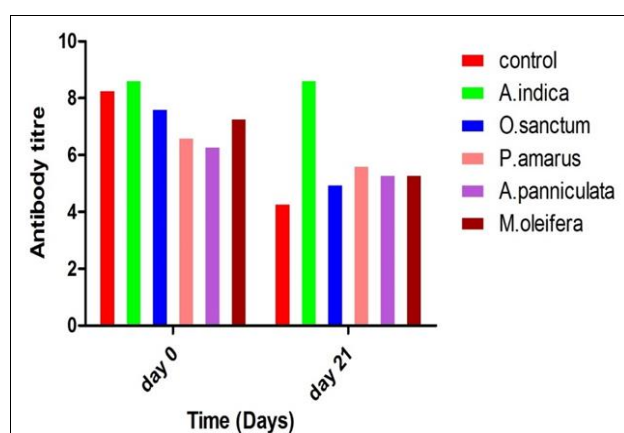
Table 1: Knowledge level of farmers in Ethnoveterinary Practices

Details	Desi chicken farmers (N=50)	
	Number	Percentage
Farmers adopting Ethnoveterinary practices	43	86.0
Farmers not practicing Ethnoveterinary practices	07	14.0
Farmers using receipe recommended by TANUVAS, Thanjavur against RD	30	60.0
Farmers not using receipe recommended by TANUVAS, Thanjavur against RD	20	40.0
Farmers using onions with buttermilk	05	10.0
Farmer using coriander leaves, greens and other vegetable waste	02	4.0
Farmers using neem leaves along with turmeric	03	6.0
Farmers using sesame seeds soaked in buttermilk	01	2.0
Farmer preferring readymade preparations	40	80.0
Occurrence of Ranikhet disease	39	78.0
Occurrence of Fowl pox	08	16.0
Unaware of diseases	03	6.0

It was found that 86.0 per cent of the farmers under this study were adopting ethnoveterinary practices in desichicken farming. Thus, this data represented that the farmers were utilizing the herbs for preventive and treatment purposes. It also showed that the farmers were attributable to lack of knowledge of use of vaccines, lack of cold storage, unavailability of vaccine and possible effectiveness of the ethnoveterinary medicine in curing of the diseases. The results of the present study are in accordance with Moreki (2013) ^[14] who recorded 79 per cent of the family poultry farmers were using traditional remedies for treating and control of diseases and parasites.

In the present study, 60.0 per cent of farmers rearing desichicken in Pudukkottai district were following the recipe against RD recommended by the TANUVAS. The herbal preparation recommended by TANUVAS contains *Allium cepa*-5 numbers, *Allium sativum*-5 numbers, *P. amaru*-50 g, cumin seeds-10 g, Pepper-5 g and turmeric-5g. The ingredients were grinded and made into small balls and given to the birds against RD which gained importance among farmers. From this study, 78 per cent of desichicken rearing farmers said that the major disease affecting desichicken is RD are in agreement with the earlier reports of Moreki (2013) ^[14] who also recorded eighty per cent of farmers reported the same disease condition.

Effect of medicinal plants on Haemagglutination inhibition titer mean ($\pm$ S.E.) in Desichicken



Antibody titre against RD of Desichicken treated with different herbs was presented in the Figure 1. The results revealed that HI titres of groups treated with herbs were numerically significant when compared with the control. The results of this study is in accordance with Arivuchelvan *et al.*, (2012) ^[4] who stated that analysis of Haemagglutination Inhibition (HI) titre among the groups treated with *O. sanctum* had no significant difference. Among the treatment groups.

Conclusion

From this study it is concluded that ethnoveterinary practice in desichicken farming has gaining its importance through control and treatment of diseases. Thus, the herbs used for the study showed immunoprotective effect against RD. In future, further research studies have to be conducted to explore the ethnoveterinary practices particular to their region. The antibody (HI) titre against RD in desichicken showed non-significant but, numerically difference among the herb treated groups while *A. indica* group had higher titre value as compared to other treatment groups. Among the 86 per cent of the ethnoveterinary practicing respondents, 80.0 per cent of the respondents had an affinity towards readymade preparation.

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Conflict of Interest

Not available

Financial Support

Not available

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