

Can We Convince Veterinarians About Positive Aspects of Parasites?

Ummer Rashid Zargar, M. Z. Chishti and M.I. Rather

Centre of Research for Development (CORD), University of Kashmir-190006, Srinagar, J&K, India

ABSTRACT

Parasites are ubiquitous (omnipresent) in nature and have made their position in an ecosystem so special that researchers are now convinced that these tiny creature are not only disease causing agents but are playing an important role at different levels. But the question is how to convince veterinarians who have advocated negative aspects of parasites for decades. We present here an opinion piece which will highlight some of the important positive aspects of parasites that came into limelight in last two or three decades. Parasites show great promise in ecological monitoring, disease healing and in predicting the fundamental ecological principles. We suggest more debates and discussions on this important interdisciplinary approach of parasites.

Keywords: Parasite; veterinarians; ecological principles; ecological monitoring

INTRODUCTION

Parasites previously considered only infection agents, have been now considered beneficial in different respects. Thanks to researchers involved in ecological studies. For an ecologist, parasite is an essential part of an ecosystem. They (parasites) have co-existed with their host for millions of years and have sustained their existence. On one hand, some researchers are looking for new and innovative drugs to eliminate the very existence of parasite whereas on the other hand some ecologists/researchers believe parasites are an essential component of an ecosystem.

In ecological terms every organism has its special position in an ecosystem and for ecological balance, the diversity and density of organisms is to be maintained. But the question is can we convince those who have advocated negative aspects of parasites for years. This tug of war will continue between two schools of thought; one believing that parasites are an important part of an ecosystem and another considering them detrimental/unproductive. But, the important thing is that there is open debate on this issue at different levels (Fig. 1)

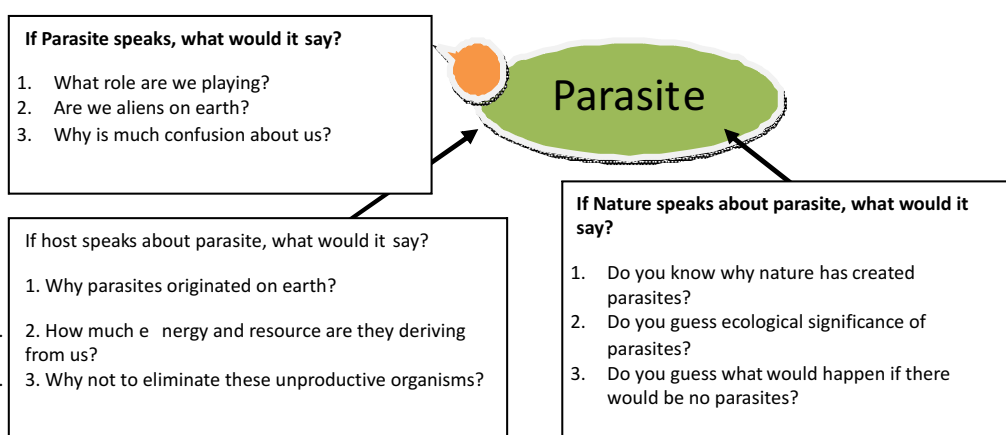


Fig: 1 Authors hypothetical idea how parasite, host and nature will comment about parasite if asked so.

We need debate on positive nature of parasites

There is also fear psychosis related to the word parasite. Whenever there is talk about word 'parasite' people take it in negative sense. So, how to remove this fear psychosis from the general public in general and veterinarians in particular? Irony is that there is also confusion among the veterinarians/ecologist who are dealing with this subject.

Before we start convincing the people about the positive aspects of parasites, we need to know why parasites are so special. Their specialty lies in the fact that they have got important position in ecosystem functioning and environmental monitoring.

We also know that there are negative aspects of parasites. There are number of diseases which are caused by parasites which have got negative impact on the animal productivity. So we have to discuss it both ways so that there will remain no confusion among different parties.

On 3rd December, 2003 a programme (“Bodysnatchers”) was broadcasted on BBC one at 2100 GMT and the headline read as “Eat worms - feel better”. For layman this news was quite amazing because worms/parasites are usually considered as harmful to human beings. There have been various reports where researchers have found medicinal value of helminthes. Reddy and Fried (2009) reviewed the use of helminthes to treat Crohn's and other autoimmunune diseases. Various issues are discussed in this review like the use of *Nicator americanus* larvae to treat autoimmune disease and other related diseases (Table 1). There have been also reports where researchers believe that helminthes can be useful for curing different inflammatory reactions including allergies (Mckay, 2000).

Table 1: Medicinal value of different parasites / parasite groups

Parasite group	Can be helpful against	Reference
Helminth	Allergy	Cooper, 2009; Bell, 1996
Intestinal worms	Allergy	Cooper, 2004
Helminth	Autoimmunity	Sakaguchi, 2004
Helminth	inflammatory bowel disease	Reddy and Fried 2008
Helminth infections	malaria antigens	Wiria et al., 2010
Helminth	Epilepsy and Poliomyelitis	Fulghum, 2008

At this time we are concerned about the changed trend in biodiversity due to habitat alteration and global warming. The more concern is about the extinction of species which is going at a faster pace. It has been proposed by different workers that parasites play an important role in driving the biodiversity and ecosystem functioning (Hudson *et al.*, 2006). Under such circumstances there is need to recognize the role of parasites by non-parasitologists so that there is a joint consensus to look into ways by which parasites drive the biodiversity pattern.

Parasites not only have beneficial aspects but also can Help Revise Ecological Theory. Recently, Ryan Hechinger, associate research biologist at the University of California, Santa Barbara with his co-authors published a revised ecological theory in the Journal Science. According to Kevin Lafferty the revised theory will have great implications for research workers and veterinary health managers (Hechinger *et al.*, 2011).

If we think parasites are worthless, then we have to think world without parasites and its consequences. In the news feature “A WORLD WITHOUT MOSQUITOES” on 22nd August, Fang (2010) has nicely stated the consequences of eradicating the mosquito's. He explains what hurdles are there to eradicate the mosquito from this earth. There are other issues which are important before we start eradication. David Dickson (2011) in his Editorial entitled “Eradicating disease: an ambitious but energizing goal” explains various issues which should be taken care off while thinking of eradication. On this editorial another article in the form of letter came on the Sci Dev which read as “Proceed with caution on disease eradication” where author wants to convey that we should first reach to consensus on this issue before starting eradication programmes (Zargar, 2011).

Can we really convince animal health worker on the positive nature of parasites

Obviously debates will continue, but it also seems that there are differences among the parasitologists whether parasites should be removed or should be retained

(Fig.2). This stems from the fact that on the one side parasitologists put forward steps to eliminate parasites and on the other side some parasitologists have their reservations on elimination programmes.

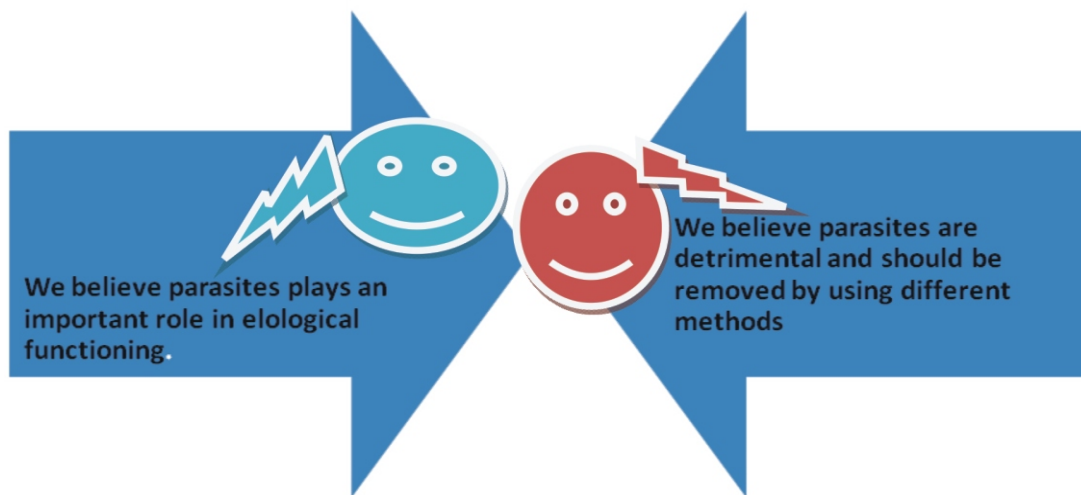


Fig: 2. Differences in argument between parasitologists regarding the role of parasites.

Now question arises can we convince veterinarians about positive aspects of parasites? Will they agree when majority of animal health workers are devising mechanisms to eradicate parasitic infection by using different chemotherapies? Although it is difficult to assure an animal health worker about positives of parasites, but in ecological terms we can surely make an impact on veterinarians. In last few decades authors have tried to convince the general public about the positive nature of parasites. Thomas et al. (2000), for example, reviewed how parasitized individuals enjoy special advantage over un-parasitized con-specific. Although there are some important issues which need to be dealt before we are able to give logical conclusion whether parasites are really useful creatures.

So, where are we now? We actually are at crossroads where we have to think both ways; one to have a control over parasitic diseases which poses great loss to

animal life and second to propagate positive aspects of parasites in ecological functioning among the general public. This can be accomplished by taking all parties which deal with parasite related issues in confidence so that general consensus is somehow reached.

REFERENCES

- Dickson, D. 2011 Eradicating disease: an ambitious but energizing goal. Science and Development Network <http://www.scidev.net/en/health/health-policy/editorials/eradicating-disease-an-ambitious-but-energising-goal-1.html>
- Fang, J. 2010. Ecology: A world without mosquitoes. *Nature* **466**: 432-434.
- Hechinger, R.F., Lafferty, K.D., Dobson, A.P., Brown, J.H. and Kuris, A. M. 2011. A common scaling rule for abundance, energetics, and production of parasitic and free-living species. *Science* **333**: 445-448
- Hudson, P. J., Dobson, A. P., Lafferty, K. D. 2006. Is a healthy ecosystem one that is rich in parasites? *Trends in Ecology and Evolution*, 21: 381-385.
- McKay, D. M. 2000. The beneficial helminth parasite. *Parasitology*, **132**:112
- Reddy, A. and Fried, B. 2009. An update on the use of helminths to treat Crohn's and other autoimmune diseases. *Parasitol. Res.* **104**: 2172-21.
- Thomas, F., Poulin, R., Guégan, J-F, Michalakis, Y. and Renaud, F. 2000. Are there pros as well as cons to being parasitized? *Parasitology Today*, **16**: 533-536.
- Zargar, U. R. 2011. Proceed with caution on disease eradication. Science and Development Network <http://www.scidev.net/en/health/health-policy/editor-letters/proceed-with-caution-on-disease-eradication-1.html>