



E-ISSN: 2320-7078

P-ISSN: 2349-6800

JEZS 2018; 6(2): 112-115

© 2018 JEZS

Received: 26-01-2018

Accepted: 27-02-2018

**Mehtab Ali Mahar**
 Department of Zoology, Shah  
Abdul Latif University,  
Khairpur, Sindh, Pakistan
**Abdul Manan Sheikh**
 Department of Zoology, Shah  
Abdul Latif University,  
Khairpur, Sindh, Pakistan
**Nadir Ali Birmani**
 Department of Zoology,  
University of Sindh, Jamshoro,  
Sindh, Pakistan

## Prevalence of malarial parasites *Plasmodium* in human population of taluka Sukkur, Sindh, Pakistan

**Mehtab Ali Mahar, Abdul Manan Sheikh and Nadir Ali Birmani**

### Abstract

The study was designed to investigate the *Plasmodium* prevalence in human population of Taluka Sukkur, Sindh, Pakistan from January 2014 to December 2014. The analyzed data was based on the age, gender and month wise. Out of 1985 observed cases of malaria 9.87% were reported positive. *Plasmodium vivax* 81.63% and *Plasmodium falciparum* 18.36% were reported out of positive cases. *Plasmodium vivax* was described 100% in April, September and October, and 56.25% in May. While, *P. falciparum* was recorded as the highest 43.75% in May and it was not recorded in the April, September and October. Prevalence of *P. vivax* in male and female was recorded higher, than prevalence of *P. falciparum*. The *P. vivax* prevalence was highest 84.90% in 21 and above year age category and the lowest 71.42% in 1-10 year age category. However, *P. falciparum* infection was found highest 28.57% in 1-10 year age category and lowest 15.09% in 21 and above year age category.

**Keywords:** *P. vivax*, *P. falciparum*, sukkur, Sindh, Pakistan

### Introduction

People of world generally and tropical and subtropical regions especially suffers badly from menace of malaria<sup>[1, 2]</sup>. It has affected more than three billion people in the world<sup>[3]</sup>. Malaria is caused by *Plasmodium* which transmitted through biological vector, female *Anopheles*. Moreover, Malarial parasites can also be spread congenitally or affected blood especially through blood transfusion or reuse of needles. World health organization has revealed that majority of Pakistan population is infected with malarial parasite and almost 18% population is under critical zone<sup>[5]</sup>. As malaria is among high prevalent diseases in Pakistan, researchers have analyzed the prevalence of its pathogen time to time in different cities and districts of Pakistan.

Yar *et al.* studied the *Plasmodium* prevalence in the population of Multan of Punjab. He observed 61.3% positive cases of *Plasmodium vivax*<sup>[6]</sup>. Durrani *et al.* investigated malaria in Baluchistan and observed cerebral malaria as major concern in population. His findings revealed that 63.61% children and 36.39% adults suffered from malaria<sup>[7]</sup>. Akbar recorded higher infection of *P. falciparum* (64.56%) than *P. vivax* (35.44%) in children at Karachi, Sindh<sup>[8]</sup>. Mohammad and Hussain conducted studies in Quetta, Baluchistan, and recorded increment in malaria infection from 22.12% to 44.44% in between 1991 to 1995<sup>[9]</sup>. In district Bunir, the maximum infection (11.61%) was noted during the month of August, whereas, less infection (3.9%) was noted in the month of March. Jamal *et al.* studied 200 children cases at Attock and reported higher infection of *P. vivax* (62.6%) than *P. falciparum* (37.4%)<sup>[10]</sup>. Nizamani *et al.*<sup>[11]</sup> reported 2.42% of malarial infection in some districts of Sindh. Uttra *et al.*<sup>[12]</sup> studied malaria and found 52.4% prevalence of *P. vivax* and 47.6% of *P. falciparum* in studied locality. Junejo *et al.*<sup>[13]</sup> analyzed the samples of malarial patients at Larkana during 2008. He noted *P. falciparum* 59% and *P. vivax* 41%. World health organization<sup>[14]</sup> has enlisted malaria as most prevalent disease and informed that half of world population is suffering from it. It is scientific fact that malaria is caused by different species of *Plasmodium*. They produce diverse sign and symptoms and sometime become fatal. More than one million people die due to malaria.

Sukkur is a highly populated taluka of Sukkur division and is located on right bank of river Indus. It experiences variable climate, very hot in summer and cold in winter. The highest temperature recorded in Sukkur ranges between 45-50°C. The dense population of mosquitoes

### Correspondence

**Mehtab Ali Mahar**
 Department of Zoology, Shah  
Abdul Latif University,  
Khairpur, Sindh, Pakistan

commonly found here. If people bitten by infected female *Anopheles* results in malaria. Therefore, for management and planning to eradicate and minimize the effects of malaria, present study was designed. This study found prevalence of *Plasmodium* specie in the population of taluka Sukkur. Present report is based on the analysis of data collected observed during above discussed research.

**Materials and Methods**

The study was carried out from January 2014 to December 2014. The malarial patient record was obtained from Civil hospital, Malarial centers and Basic health units of taluka Sukkur. The data was gathered on weekly basis as per method of Yasinzai and Kakarsulemankhel [15, 16]. The record was arranged and sorted out month-wise. In order to observe age-wise infection, three groups from 1-10 years, 11-20 years and 21 and above years were made. The data also analyzed gender-wise into male and female cases. It was further processed statistically to obtain complete spectrum of *P. vivax*

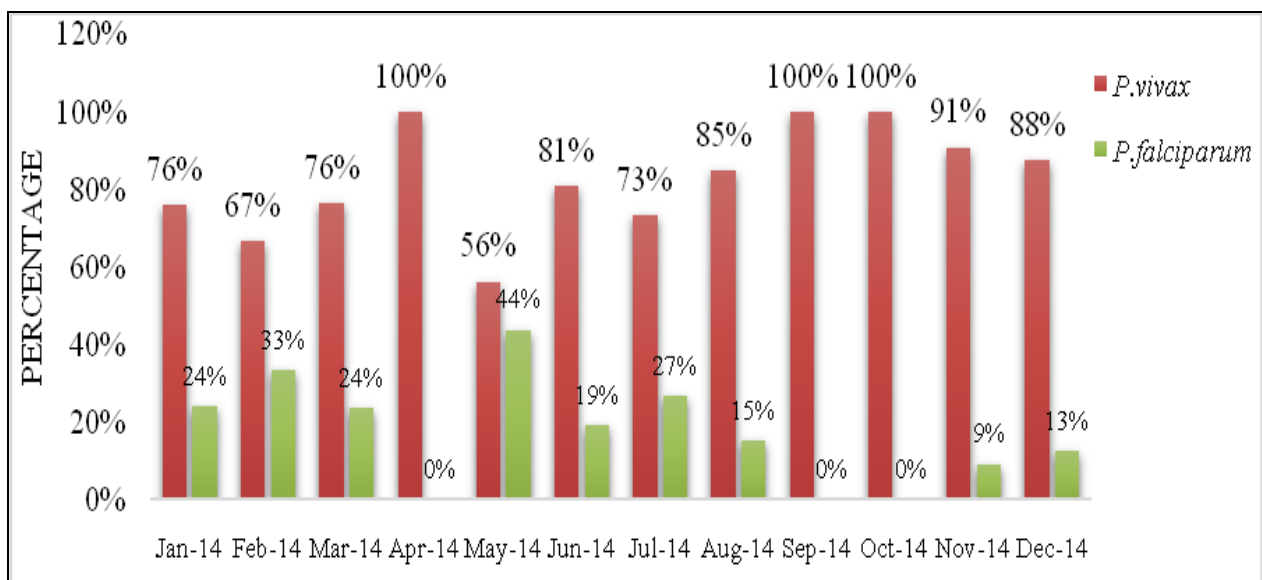
and *P. falciparum* prevalence in under study locality.

**Results**

A Total of 1985 suspected cases of malaria were studied for assorting infection of *Plasmodium* (i.e., *P. vivax* and *P. falciparum*) from taluka Sukkur. The results revealed 81.63% positive cases of *P. vivax* and 18.36% of *P. falciparum* (Table No-1). Whereas, *P. vivax* was more prevalent in April, September and October, and less common in May. The *P. falciparum* was more prevalent in May and not observed in April, September and October (Graph-01). Furthermore, results show that *P. vivax* was recorded highest in the age group 21 and/or above years and as lowest in 1-10 years. *P. falciparum* was recorded as highest in the age group of 1-10 years and as lowest in 21 and/or above years. (Table No- 2 & Graph-02). As far as gender-wise prevalence is concerned, *P. vivax* found in highest ratio in males and females, whereas, *P. falciparum* was reported lowest in males and females in present locality (Table No-3 & Graph-03).

**Table 1:** Month-wise prevalence of *P. vivax* and *P. falciparum* in Sukkur taluka

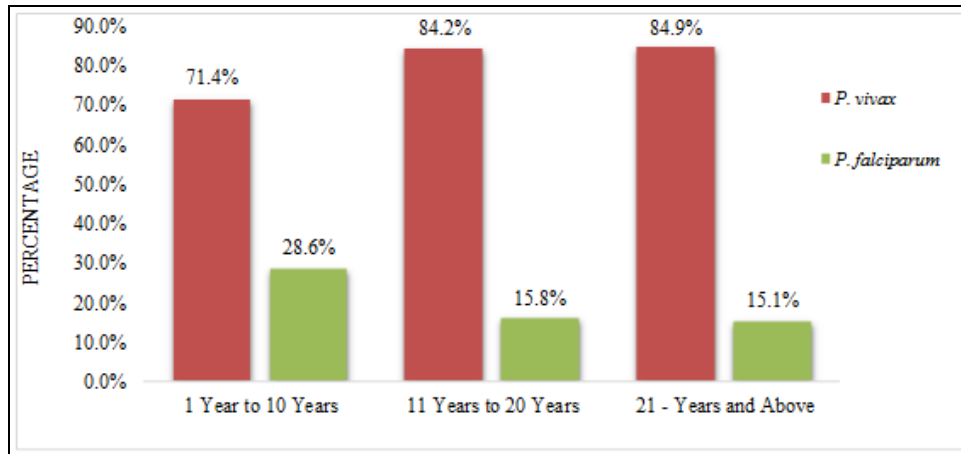
Month-wise	Suspected cases	Positive cases%	% of <i>P. vivax</i> out of positive cases	% of <i>P. falciparum</i> out of positive cases
Jan-14	216	11.57%	76%	24%
Feb-14	119	5.04%	66.66%	33.33%
Mar-14	162	10.49%	76.47%	23.52%
Apr-14	126	6.34%	100%	00%
May-14	169	9.46%	56.25%	43.75%
Jun-14	208	10.09%	80.95%	19.04%
Jul-14	167	8.98%	73.33%	26.66%
Aug-14	206	16.01%	84.84%	15.15%
Sept-14	149	7.38%	100%	00%
Oct-14	112	5.35%	100%	00%
Nov-14	204	10.78%	90.90%	9.09%
Dec-14	147	10.88%	87.5%	12.5%
Total	1985	9.87%	81.63%	18.36%



**Graph 1:** Month-wise prevalence of *P. vivax* and *P. falciparum* out of positive cases in Sukkur taluka

**Table 2:** Age-wise prevalence of *P. vivax* and *P. falciparum* in Sukkur taluka

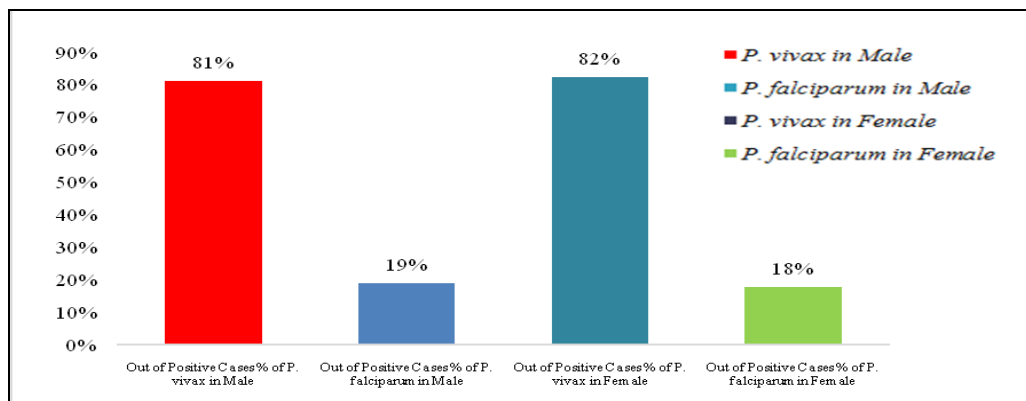
Age-wise	% of <i>P. vivax</i> out of positive cases	% of <i>P. falciparum</i> out of positive cases	Total positive cases
1-10 years	71.42%	28.57%	42
11-20 years	84.15%	15.84%	101
21 and/or above years	84.90%	15.09%	53
Total	81.63%	18.36%	196



**Graph 2:** Age-wise prevalence of *P. vivax* and *P. falciparum* out of positive cases in Sukkur taluka.

**Table 3:** Sex-wise prevalence of *P. vivax* and *P. falciparum* in Sukkur taluka

Taluka	Positive cases in male	% of <i>P. vivax</i> in male out of positive cases	% of <i>P. falciparum</i> in male out of positive cases	Positive cases in female	% of <i>P. vivax</i> in female out of positive cases	% of <i>P. falciparum</i> in female out of positive cases
Taluka Sukkur	111	81.08%	18.91%	85	82.35%	17.64%



**Graph 3:** Sex-wise prevalence of *P. vivax* and *P. falciparum* in taluka Sukkur

**Discussion**

Malaria is major problem affects 300 million people and results in death of a million people throughout the world annually. It is transmitted through Mosquito. Along with other third world countries, Pakistan is also affected by it seriously. It is due to poor sanitation and inadequate health services. Moreover, *P. vivax* is prime malarial parasites seen in Asia and it may be due to the high population density. While, *P. falciparum* is also listed as causative agent of malignant malaria, which is also cerebral malaria and grows quickly and destroy blood and results in anemia [17].

In the current study, a total of 1985 suspected cases were observed out of which 9.87% were positive cases. Out of which *P. vivax* recorded with highest ratio (81.63%) and *P. falciparum* with lowest ratio (18.36%). Number of studies by many researchers have been conducted in many localities and reported the higher prevalence of *P. vivax* [6, 9, 13, 16, 18, 20-26]. During current study *P. vivax* was recorded 100% in the month of April, September and October, while, 56.25% in the month of May. *P. falciparum* was recorded 43.75% in May and 100% in April, September and October. Jan and Kiani [18] recorded 9% in the August and 5% in September. Yasinzai and Kakarsulemankhel [15] recorded 84.5% of *P. vivax* in October and the 62.5% in January, while *P. falciparum* reported 37.7% in January and 15.4% in October. Yasinzai and Kakarsulemankhel [21] recorded *P. vivax* (91.4%) in December and the 71.4% in January, while *P. falciparum*

28.5% in January and 8.5% in December. Yasinzai and Kakarsulemankhel [16] recorded *P. vivax* 91.2% in April and 69% in December, while *P. falciparum* 30.9% in December and 8.7% in April.

During current study *P. vivax* was recorded 84.90% in 21 and above year age group and the 71.42% in 1-10 year age group, while *P. falciparum* was recorded 28.57% in 1 to 10 year age group and 15.09% in 21 and above year age group. Jan and Kiani [18] recorded *P. vivax* 8.41% in 11-20 year age group and 6.12% in 21 and above year age group, while *P. falciparum* was recorded 4.08% in 21 and above year age group and no infection was seen in other age group. Yasinzai and Kakarsulemankhel [15] recorded *P. vivax* 72.3% in 11-20 year age group and 71.2% in 1-10 year age group, while *P. falciparum* 28.7% in 1-10 year of age group and 27.6% in 11-20 year age group. Yasinzai and Kakarsulemankhel [21] recorded *P. vivax* 90.7% in 1-10 year age group and 84.4% in 21 and above year age group, while *P. falciparum* 14.5% in 21 and above year of age group and 9.2% in 1-10 year age group. Yasinzai and Kakarsulemankhel [16] recorded *P. vivax* 84.3% in 1-10 year age group and 80% in 21 and above year age group, while *P. falciparum* 19% in 21 and above year of age group and 15% in 1-10 year age group.

During current study *P. vivax* was recorded highest in both male (81.08%) and female (82.35%), while *P. falciparum* was recorded lowest in both male (18.91%) and female (15%). Yasinzai and Kakarsulemankhel [21] recorded *P. vivax* 86.6%

in male and 84.9% female, while *P. falciparum* was recorded 13.3% in male and 15.0% in female.

### Conclusions

Present study suggests that *P. vivax* is higher than *P. falciparum* in taluka Sukkur. The prevalence of *P. vivax* is much prevalent in April, September and October months, while *P. falciparum* is much prevalent in the month of May. There is no relation to sex of patients because *P. vivax* is found more and *P. falciparum* is less prevalent in both sexes. Current study suggests that *P. vivax* is more prevalent in age group 21 and above year age group, while *P. falciparum* is more prevalent in 1-10 year age group.

### Acknowledgment

We are grateful to Professor Dr. Aftab Ahmed Soomro, the Principal Ghulam Muhammad Mahar Medical College Sukkur, who allowed for collecting data from different Hospitals, Basic Health Units of Taluka Sukkur.

### References

1. World Health Organization. A global strategy for malaria control. Geneva WHO, 1993a.
2. World Health Organization. A global strategy for malaria control. Geneva WHO, 1993b.
3. WHO/UNICEF. World Malaria Report Geneva. 2005.
4. Goering RV, Mims CA. Mims' Medical Microbiology. 4<sup>th</sup> edition Mosby Elsevier, 2008.
5. World Health Organization. World Malaria Report. Geneva, 2009.
6. Yar HM, Masood K, Maqbool A, Malik GQ. Prevalence of malarial parasite species in Multan district. Professional Medical Journal. 1998; 5:183-7.
7. Durani AB, Durani I, Abbas N, Jabeen M. Epidemiology of cerebral Malaria and its mortality. Journal Pakistan Medical Association. 1997; 47:213-215.
8. Akbar JU. Malaria in children at Children Hospital. Journal of College of Physician and Surgeons Pakistan. 1997; 7:20-2.
9. Mohammad N, Hussain A. Prevalence of malaria in general population of district Bunir. Journal of Pakistan Medical Institute. 2003; 17(1):75-80.
10. Jamal MM, Jehon A, Nadir A. Malaria in pediatric age group: a study of 200 cases. Pakistan Armed Forces Medical Journal. 2005; 55:74-77.
11. Nizamani A, Kalar NA, Khushk IA. Burden of malaria in Sindh, Pakistan: a two years surveillance report. Journal of Liaqat University of Medical and Health Sciences. 2006; 5:76-83.
12. Uttra CKM, Devrajani BR, Shaikh K, Shaik KR, Shah SZA. Severity of Thrombocytopenia and Prolonged Bleeding Time in Patients with Malaria (A Clinical Study of 162 Malaria Cases). World Applied Science Journal. 2010; 9(5):484-488.
13. Junejo AA, Abbasi KA, Chand H, Abbasi S. Malaria in Children at Children Hospital Chandka Medical College Larkana. Medical Channel. 2012; 18(1):55-57.
14. World Health Organization. World Malaria Report, Geneva, 2015.
15. Yasinzai MI, Kakarsulemankhel JK. Prevalence of Human Malaria Infection in Pakistan: District Dera Murad Jamali. Pakistan Journal of Science. 2008; 60:3-4.
16. Yasinzai MI, Kakarsulemankhel JK. Prevalence of Human Malaria Infection in Bordering Areas of Baluchistan with Sindh Province: District Jaffarabad. Journal of Postgraduate Medical Institute. 2012; 26(03):277-282.
17. Bhalli MA, Samiullah. *Falciparum* malaria-a review of 120 cases. Journal of College of Physician and Surgeons Pakistan. 2001; 11:300-303.
18. Jan AH, Kiani TA. Haematozoan parasites in Kashmiri refugees. Pakistan Journal Medical Research. 2001; 40:10-12.
19. Sheikh AS, Sheikh AA, Sheikh NA, Paracha SM. Endemicity of malaria in Quetta. Pakistan Journal of Medical Research. 2005; 44:41-45.
20. Yasinzai MI, Kakarsulemankhel JK. Frequency of various human malaria infections in hottest areas of central Baluchistan, Pakistan: Duki, Harnai and Sibi. Pakistan Armed Forces Medical Journal. 2008d; 58(3):276-285.
21. Yasinzai MI, Kakarsulemankhel JK. Incidence of human malaria infection in Central Baluchistan, Pakistan: District Bolan. Biologia. 2009; 55 (1, 2):43-50.
22. Murtaza G, Memon IA, Memon AR, Lal MN, Kallar NA. Malaria morbidity in Sindh and the *Plasmodium* species distribution. Pakistan Journal of Medical Sciences. 2009; 25(4):646-649.
23. Hozhabri S, Akhtar S, Rahbar M, Lubi S. Prevalence of *Plasmodium* slide positivity among the children treated for malaria, Jhangara, Sindh. Journal of Pakistan Medical Association. 2000; 50:401-5.
24. Mahmood K, Jiramani KL, Abbasi B, Mahar S, Samo H, Talib A. *Falciparum* malaria: various presentations. Pakistan Journal of Medical Sciences. 2006; 22:234-7.
25. Farooq MA, Salamat A, Iqbal MA. Malaria: an experience at CMH Khuzdar (Baluchistan). Journal of College of Physician and Surgeons Pakistan. 2008; 18:257-8.
26. Devrajani BR, Jaffery MH, Shah SZA. Spectrum of Malaria (Six months hospital based cross sectional descriptive study). Medical Channel. 2009; 15(4):30-33.
27. Khan HU, Khattak AM, Khan MH, Mahsud IU, Humayun S. A study of prevalence of malaria in adult population of D. I. Khan, Pakistan. Biomedical. 2013; 22:99-104.