

## A Survey on Residential Areas Infestation to House Pests (Arthropods) in Kashan

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Article information	Abstract
<p>Article history: Received: 28 July 2012 Accepted: 3 Dec 2012 Available online: 22 Apr 2013 ZJRMS 2013; 15(12): 36-39</p> <p>Keywords: House pest House Infestation Arthropod</p> <p>*Corresponding author at: Scientific Members of Kashan Medical Sciences University, Kashan, Iran. E-mail: dehghani37@yahoo.com</p>	<p><b>Background:</b> Due to importance of arthropods as urban pest, such Health and Nutritional, Textile, Structural, Storage pest and role of them in human being, this study was done to show determine of houses infestation status to urban pest (Arthropods) city of Kashan in 2010.</p> <p><b>Materials and Methods:</b> A Descriptive-analytical study has been done on houses The houses were selected by cluster random and Urban pests of them, by use of hand lens were identified. The results were analyzed using abundance tables and SPSS-11.5 software and statistic tests <math>\chi^2</math> and fisher exact.</p> <p><b>Results:</b> The results of study have shown that prevalence of urban pest, Health pest 99.6%, Nutritional pest 32.6%, textile and structural pest 37.4% were seen. Out of total houses, 98% mosquitoes, 96.4% ant, 92.6% fly, 78% cockroaches species, 56.8% spider, 37.6% termite, 34.6% storage pests, 12% clothes moth, 8.2% scorpion species, 3.6% bug, 3.2% tick and 2.6% millipede were identified.</p> <p><b>Conclusion:</b> The prevalence of infestation urban pest is high. Mosquitoes, ant, fly and cockroach were seen more the other. So methods control training, houses protection and solid and water waste management is being suggested.</p> <p>Copyright © 2013 Zahedan University of Medical Sciences. All rights reserved.</p>

### Introduction

Arthropods are of invertebrate animals which have adapted to the most natural ecosystems because of their high morphologic and physiologic abilities [1]. Many of them are directly related to the human life especially, insects and arachnids [2]. Arthropods can affect human welfare and health by disease transmission [3]. Arthropods can transmit most of pathogenic factors mechanically or biologically from their natural origins, in addition to damage the agriculture and economy [4].

Many arthropods such as cockroaches, termites, bugs and mites are important in terms of general health [2]. Regarding to investigations in Guilan, stable is the internal place for resting and feeding of mosquitoes and their main host, cows [5]. House flies have been known as the disease vectors of many pathogenic micro organisms to the human [6]. Cockroaches are the other insect groups which act as the mechanic vectors of fungal pathogenic, bacterial, viral and protozoa agents [7-10]. According to the studies in Malaysia and Poland, it's been specified that cockroaches have become resistant against permethrin [7]. In addition, cockroaches are as the second main factor for asthma, after the allergy house dust [10].

Some of them like American cockroaches multiply in waste water canals and reservoirs and enter the buildings and store houses [8]. Controlling different pests depends upon the various species, their growth and life habits of them [11]. In addition, to have a successful control needs a management resistance system against pesticides [12]. Regarding to the importance of determine arthropod abundance, place of their growth and proliferation in

Kashan houses so that the health system tries to provide preventative and training solutions.

### Materials and Methods

This study has been done in a descriptive- analytical method, during that 500 houses were selected randomly and clusteringly in different regions of Kashan. So that first, central limit of Kashan was divided in to two new and old, using the map in municipality and then by AutoCAD software each division was clustered and in each cluster the streets were selected randomly regarding to population covered. Next, each street was visited and from the beginning of the street by cooperation of family head, different parts of the houses were observed and studied. After preparing a justifiability questionnaire, it was confirmed by the experts in their view, way of gathering proper information was related to the reasons.

On durability of initial questionnaire, it was distributed among the houses residents twice and in a pilot way and after necessary explanations they were filled out by the residents twice in two weeks the questions with lower than 60% match in reply were removed after study. Totally, the durability of the questionnaire was measured 60 to 90%. Questionnaires filled out after observation of parts of the houses and the gathered samples were recognized by using hand loops. Non recognizable samples were transformed to the lab and recognized by stereomicroscope. Pictures after completion and collection of the questionnaires in each cluster, the obtained information were input into the check list and

then the results were analyzed using abundance tables and spss-11.5 software and statistic tests chi-squared and fisher exact.

## Results

Results showed that of total 500 houses, 98% were polluted with mosquito, 96.4% with ant, 92.6% with fly, 78% with various species of cockroaches, 56.8% with spider, 52.2% with centipede, 42% with sand fly, 37.6% with termite, 34.6% with grain sitophilus, 23.4% with pillbug, 18.2% with silver fish, 15.2% with flea, 12% with moths, 8.2% with scorpion, 3.6% with bug, 3.2% with ticks and 2.6% with diplotods (Fig. 1).

The most abundance for insect observation was 94.6 percent in terms of different hours at night. Abundance of bite by different kinds of arthropod was obtained 98%. The most abundant bite by household arthropods related to mosquito with 97.4% and following that to sand fly, flea, tick and bug, with 41.2%, 14.6% and 5%, respectively. The most abundant response of people toward Arthropod bite was skin irritation with 75.8%, redness and inflammation, with 55.4%, disease risk with 6%. The most abundant bite site related to arms and feet with 91.6% (458 cases) and then to face, neck and head with 54.8% (274 cases) and body trunk and other parts with 12% (66 cases). Of 500 houses, 99.6% was polluted with health pests, 32.6% with food pests, 1.4% with textile pests, and 37.4% with building pests. The most abundant household pests in terms observed place related to the rooms with 59.6% and yard with 55.4%. The most abundant store house pest related to grains with 14.4% and then rice, flour and wheat with 13.4%, 3.8% and 1.4%, respectively. Different protective methods against insects include 143 cases (28.6%), like mosquito net 252 cases (50.4%), using window and door nets and well cap (256 cases, 51.2%). Pesticide toxin usage was 62.4% (312

cases) of which the most used one was pyrethroids with 62.4%. The most abundant usage of pesticides in terms of arthropods was related to mosquito with 49% and ant with 34.8%. The most abundant method for waste discharge was net cap equipped waste disposal with 51.2% and then without lace cap with 33.6%. Results showed that waste discharge status had a meaningful relationship with cockroaches and its abundance. Therefore, there observed 73% cockroach in houses with lace and cap and 88.1% in those without them ( $p=0.003$ ) (Table 1).

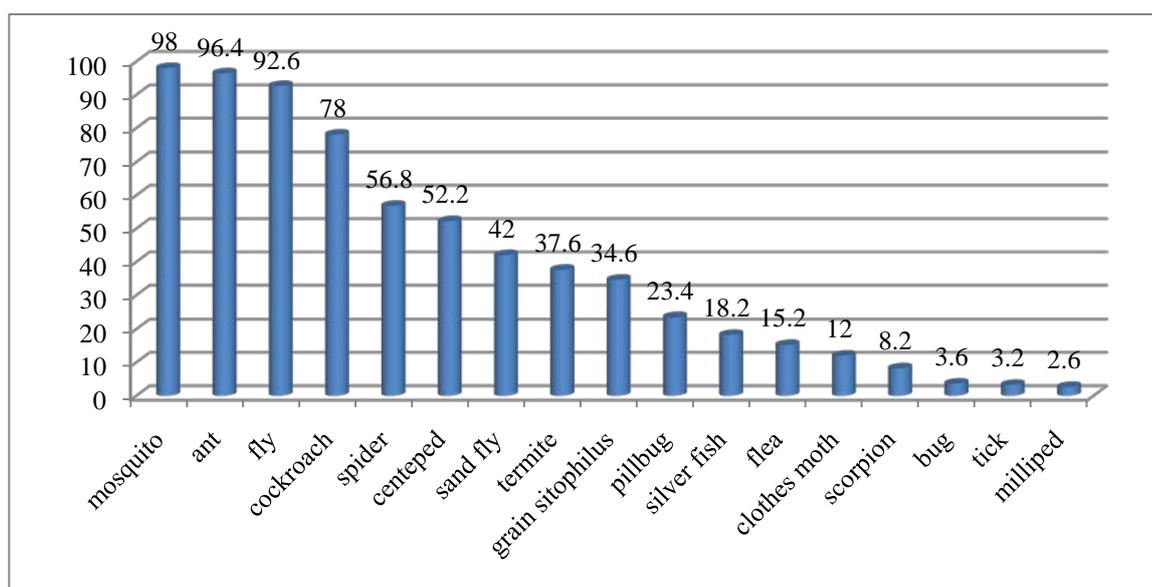
**Table 1.** Abundance distribution of insect pollution in terms of waste discharge status

waste discharge status	With net cap N(%)	Without lace cap N(%)	p-Value
Insects			
Cockroach	187(47.7)	148(37.8)	0.003
Mosquito	252(51.4)	165(33.7)	0.33
Fly	237(51.2)	156(33.7)	0.98
Sand fly	96(45.7)	80(38.1)	0.06

Results show that abundance of household an arthropod is different in terms of building oldness. And there observed a meaningful relationship between abundance of scorpion ( $p=0.03$ ), cockroach ( $p=0.019$ ) and termite ( $p=0.03$ ) and building antiquity. The most abundant pollution belonged to scorpion, cockroach and termite with 15%, 85% and 50%, respectively and was related to old houses more than 50 years old.

## Discussion

The study showed that 98% of houses were polluted with mosquito. The abundance of mosquito observation at night was more than other hours, 94.6%. Hence, regarding to the day warmth and night coldness and their cold blooded nature, these pests are more acting at nights. Which this is in accordance with other studies [5].



**Figure 1.** Relative abundance of house pollution of Kashan with household arthropods

Biting and feeding of mosquitoes at early night is a common problem in dry and tropical regions as these arthropods are killed against dry and hot weather, therefore they live in holes and dark rooms during the day and after darkness begin their activities [13]. Results showed that the most abundant signs of pest feeding appear in hands and feet and then in face. It seems that as hands, feet and face are more exposed to the air are more attacked by the mosquitoes.

Results of the study showed that 78% of houses in Kashan are polluted with many kinds of cockroaches. These arthropods, especially American ones proliferation in water reservoirs, canals, waste water canals or lace work and frequently enter the buildings and store houses. In these space which are most hidden from human eyes, their population grows a lot and at times more than several hundreds of them are seen in a waste water well [8]. 37.6% of the houses studied in Kashan were polluted with termite and pollution with this pest leads to a high damage to the houses and furniture. Dehghani et al. pointed out the damage in wooden shelves on walls [13, 14]. As the results showed, pollution of Kashan houses with scorpion was 8.2% which is expected to be more abundant regarding to the rule of spread of scorpion fauna in tropical and hot places like Kashan [15, 16]. However as it was determined, scorpion presence in houses had a meaningful relation with the oldness of the buildings statistically and the most abundance related to the houses over 50 years. According to this fact that most houses under study had been constructed recently and were not so old, so the abundance of scorpion obtained less than the expected level. Results of the study showed that the most pollution of the old house over 50 years related

to pests like scorpion, cockroach and termite, and it can be noted that these pest are more found in the old houses for the materials applied in the buildings (such as bricks) or using mud and straw in walls and roofs and also large area of the houses and their open waste water discharge system [13]. Since waste water wells are more susceptible to grow different kinds of cockroaches, fly and mosquito larvae, the most abundant household pests in the houses are fly and mosquito and cockroaches [17]. Therefore, protection and recognition of growth places, training of how to control the growth resources, protection methods of houses and individuals, awareness about life time of the pests and selection of time and suitable materials to fight them, improvement of resident environments, appropriate disposal of waste water and garbage can result in decrease of their abundance

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### Authors' Contributions

All authors had equal role in design, work, statistical analysis and manuscript writing.

### Conflict of Interest

The authors declare no conflict of interest.

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