

西安市2018年蜚蠊监测结果分析

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摘要:目的 掌握西安市蜚蠊种类、密度、侵害率、分布特点及季节消长等情况,为蜚蠊防制措施的制定和爱国卫生工作提供科学依据。方法 按照地理方位在西安市东、南、西、北选择6个区(县),每个区(县)选择宾馆、餐饮行业、超市、居民区、农贸市场和医院共6个监测点,2018年奇数月中旬监测,采用粘捕法,晚放晨收,鉴定种类,计算蜚蠊密度和侵害率,蜚蠊密度和侵害率之间相关性检验采用Pearson相关性分析,城区和郊区之间的侵害率差异采用 χ^2 检验,不同月份之间蜚蠊密度差异采用 t 检验。结果 共捕获蜚蠊233只,均为德国小蠊。蜚蠊密度为0.07只/张,侵害率为3.85%。侵害最严重的是农贸市场和餐饮行业,密度分别为0.15和0.13只/张;蜚蠊密度季节消长呈现波动趋势,7月最高,为0.10只/张,侵害率呈现双峰趋势,最高峰为3和7月,分别为3.81%和5.61%;城区蜚蠊密度和侵害率均高于郊区。结论 2018年西安市蜚蠊侵害最严重的是农贸市场和餐饮行业;7月蜚蠊密度最高;城区蜚蠊密度和侵害程度高于郊区。建议继续加强监测,在7月加强防控,尤其要对农贸市场和餐饮行业制定有针对性的蜚蠊防制措施,将蜚蠊密度和侵害率控制在较低水平。

关键词: 蜚蠊; 种类; 密度; 侵害率; 季节消长

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An analysis of surveillance results of cockroaches in Xi'an, China, 2018

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Abstract: **Objective** To investigate the species, density, infestation rate, distribution characteristics, and seasonal variation of cockroaches in Xi'an, China, and to provide a scientific basis for formulation of prevention and control measures against cockroaches as well as for Patriotic Health Campaign. **Methods** Six districts (counties) were selected from the east, south, west, and north areas of Xi'an, and six surveillance sites, in hotels, catering industry, supermarkets, residential areas, farmers' markets, and hospitals, respectively, were selected from each district (county). Surveillance was carried out in the middle of odd months in 2018 using the sticky trap method, with the traps placed at night and collected in the morning. The species of cockroaches were identified, and the density and infestation rate of cockroaches were calculated. The Pearson correlation test was used to determine the correlation between the density and infestation rate of cockroaches; the chi-square test was used to analyze the difference in infestation rate between urban and suburban areas; the t test was used to analyze the differences in cockroach density between different months. **Results** A total of 233 cockroaches were captured, all of which were *Blattella germanica*. The density and infestation rate of cockroaches were 0.07 cockroach/sheet and 3.85%, respectively. The most severely infested places were farmers' markets and catering industry, 0.15 and 0.13 cockroach/sheet, respectively. The cockroach density showed a seasonal fluctuation, highest in July (0.10 cockroach/sheet); the infestation rate showed a bimodal trend, with the peaks in March (3.81%) and July (5.61%); the density and infestation rate of cockroaches in urban areas were higher than those in suburban areas. **Conclusion** In 2018, the places most severely infested by cockroaches in Xi'an were farmers' markets and catering industry; the density of cockroaches was the highest in July; the density and infestation rate of cockroaches in urban areas were higher than those in suburban areas. Surveillance is recommended to be continuously strengthened, and prevention and control measures should be reinforced in July. Targeted prevention and control measures against cockroaches should be formulated, especially in farmers' markets and catering industry, to control the density and infestation rate of cockroaches at a lower level.

Key words: Cockroach; Species; Density; Infestation rate; Seasonal variation

蜚蠊与人们生活关系密切,是多种疾病的传播媒介。蜚蠊体内外不仅携带多种细菌、病毒、真菌和

寄生虫卵,其排泄物、尸体、分泌物还会造成人体过敏反应^[1-2],引发哮喘等疾病^[3]。研究发现,西安市

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德国小蠊(*Blattella germanica*)体内外病原体携带情况较为严重^[4],因此调查掌握蜚蠊种类、密度、侵害率、分布特点及季节消长等情况,对预防控制蜚蠊及所致疾病有着至关重要的作用。2018年西安市继续按照病媒生物密度监测方案开展蜚蠊现场监测,现将结果报告如下。

1 材料与方法

1.1 监测点选择 按照西安市东、南、西、北4个方位,共选择6个区(县),同时兼顾城区和郊区。每个区(县)选择6个监测点,包括宾馆、餐饮行业、超市、居民区、农贸市场和医院等,排除1周内蜚蠊消杀药物处理过的场所。

1.2 材料 选用的粘蟑纸统一规格为17 cm×10 cm,由北京绿叶世纪日化用品有限公司生产。

1.3 监测方法 2018年采用粘捕法,奇数月中进行监测。诱饵为新鲜面包,将2 g面包放置于粘蟑纸中间位置。将粘蟑纸布放于蜚蠊经常活动、取食的地方。晚放晨收。每个标准间(约15 m²)布放1张,居民区厨房布放1张。每次监测时,均使用新的粘

蟑纸^[5]。

1.4 统计学分析 每次监测后,现场登记粘捕到的蜚蠊种类,记录蜚蠊雌及雄成虫、若虫数量和回收的粘蟑纸数。雌及雄成虫、若虫总数为捕获蜚蠊总数。将数据使用Excel 2010软件录入,计算蜚蠊密度和侵害率,两者之间相关性检验采用Pearson相关性分析,城区和郊区之间的侵害率差异和成虫雌雄差异采用 χ^2 检验,不同月份之间蜚蠊密度差异比较采用 t 检验,SPSS 13.0软件用于完成统计分析, $P<0.05$ 为差异有统计学意义。蜚蠊密度和侵害率计算公式:

$$\text{蜚蠊密度(只/张)} = \text{捕获蜚蠊总数(只)} / \text{回收粘蟑纸数(张)}$$

$$\text{侵害率(\%)} = \text{阳性粘蟑纸数(张)} / \text{回收粘蟑纸数(张)} \times 100$$

2 结果

2.1 基本情况 2018年共布放粘蟑纸3 534张,回收3 405张,回收率为96.35%。阳性粘蟑纸131张,捕获蜚蠊233只,经鉴定均为德国小蠊,其中雌成虫为129只,雄成虫为80只,若虫为24只,蜚蠊密度为0.07只/张,侵害率为3.85%。见表1。

表1 2018年西安市不同生境蜚蠊监测结果

Table 1 Surveillance results of cockroaches in different habitats in Xi'an, China, 2018

生境	投放数(张)	回收数(张)	阳性数(张)	捕获蜚蠊数(只)	雌成虫(只)	雄成虫(只)	若虫(只)	蜚蠊密度(只/张)	侵害率(%)
宾馆	694	684	20	22	15	7	0	0.03	2.92
餐饮行业	421	406	29	52	29	17	6	0.13	7.14
超市	438	423	9	13	4	9	0	0.03	2.13
居民区	504	484	7	27	10	15	2	0.06	1.45
农贸市场	783	733	57	110	62	32	16	0.15	7.78
医院	694	675	9	9	9	0	0	0.01	1.33
合计	3 534	3 405	131	233	129	80	24	0.07	3.85

注:捕获的蜚蠊均为德国小蠊。

2.2 不同生境监测结果 在各生境中,蜚蠊密度和侵害率最高的是农贸市场,分别为0.15只/张和7.78%,其次为餐饮行业,最低的是医院。除超市和居民区外,其余生境雌成虫捕获量均远多于雄成虫,若虫主要在餐饮行业和农贸市场捕获。见表1。

2.3 季节消长趋势 2018年西安市蜚蠊密度呈波动趋势,在7月达到最高,为0.10只/张。侵害率呈现双峰趋势,小、大高峰为3和7月,分别为3.81%、5.61%。经Pearson相关性检验,各月蜚蠊密度和侵害率无相关性($r^2=0.652$, $P=0.113$)。见图1。

2.3.1 不同生境蜚蠊密度季节消长 农贸市场在7月以后一直处于高水平状态;餐饮行业呈现双峰趋势,3和9月为高峰期;宾馆、超市、医院等生境变化趋势不大,保持低水平状态;居民区在11月突然升高,其余时间稳定在低水平状态。见图2。

2.3.2 不同生境侵害率变化趋势 不同生境侵害率

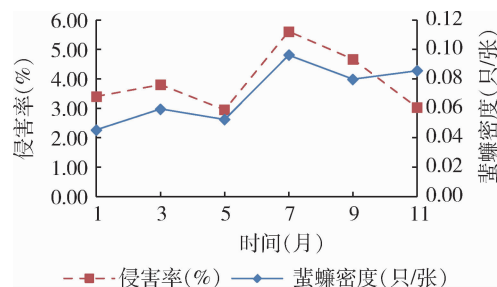


图1 2018年西安市蜚蠊密度和侵害率季节消长趋势
Figure 1 Seasonal variation in the density and infestation rate of cockroaches in Xi'an, China, 2018

结果,餐饮行业呈现单峰趋势,9月最高;农贸市场变化波动幅度较大,5月最低,而7月迅速升至峰值;宾馆在3月有1个小高峰,其余时间稳定在低水平。见图3。

2.4 城区和郊区情况比较 捕获的雌、雄成虫在城区和郊区之间的情况见表2,差异无统计学意义

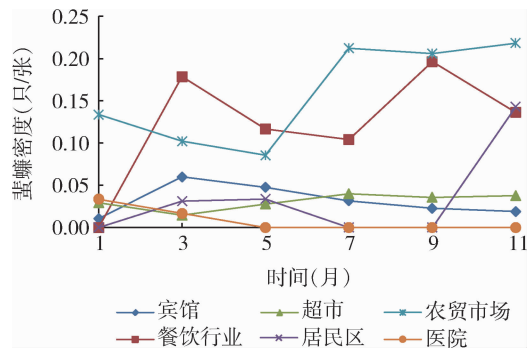


图2 2018年西安市不同生境蜚蠊密度季节消长趋势
Figure 2 Seasonal variation in cockroach density in different habitats in Xi'an, China, 2018

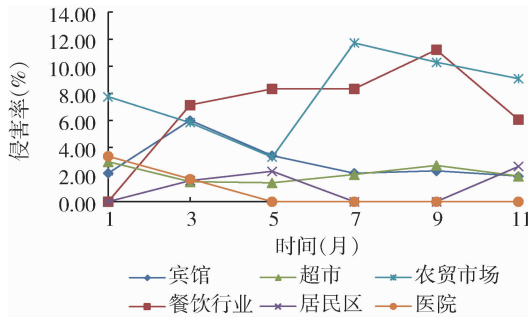


图3 2018年西安市不同生境蜚蠊侵害率季节变化趋势
Figure 3 Seasonal variation in cockroach infestation rate in different habitats in Xi'an, China, 2018

($\chi^2=0.748, P=0.491$); 蜚蠊密度在不同月份之间差异有统计学意义($t=-2.295, P=0.045$); 城区和郊

区的蜚蠊侵害率差异有统计学意义($\chi^2=8.284, P=0.003$)。见表2。

3 讨论

西安市地处关中平原中部,北濒渭河,南依秦岭,属暖温带半湿润大陆性季风气候,冷暖干湿四季分明,野外环境并不是蜚蠊理想的繁殖和越冬环境^[6],但是随着城镇化的发展,室内小气候为蜚蠊繁殖和越冬提供了条件。2018年西安市监测结果与全国相比,处于低水平,与陕西省一致^[7]。与西安市2012—2015年相比,蜚蠊密度和侵害率大幅下降^[8],可能与2015年西安市创建国家卫生城市有关^[9]。蜚蠊密度和侵害率的大幅下降也导致一些种类很难被捕获,故2018年仅监测到德国小蠊。

不同生境监测结果显示,农贸市场和餐饮行业是危害最严重的场所,仍需重点关注,与全国及西安市2012—2015年监测结果一致^[7-8]。季节消长趋势显示,7月蜚蠊密度和侵害率均是最高峰,与全国结果有所差别^[7],与泰安和东营市监测结果基本一致^[10-11],可能是这些地区气候条件类似,蜚蠊的生活习性也趋于一致。不同生境蜚蠊密度和侵害率变化趋势显示,餐饮行业和农贸市场是蜚蠊繁殖活跃场所,11月居民区蜚蠊密度突然升高,分析原因应该是天气变冷,蜚蠊开始进入温度较高和食物丰富的居民厨房,但这一结果与山东省和北京市不同,可能与

表2 2018年西安市城区和郊区蜚蠊监测结果

Table 2 Surveillance results of cockroaches in urban and suburban areas in Xi'an, China, 2018

地区	投放数(张)	回收数(张)	阳性数(张)	捕获蜚蠊数(只)	雌成虫(只)	雄成虫(只)	若虫(只)	蜚蠊密度(只/张)	侵害率(%)
城区	2 448	2 398	107	200	109	71	20	0.08	4.46
郊区	1 086	1 007	24	33	20	9	4	0.03	2.38
合计	3 534	3 405	131	233	129	80	24	0.07	3.85

以上两地居民区蜚蠊密度和侵害率较高有关^[12-13],西安市这一特点应引起注意。监测结果表明,城区蜚蠊密度和侵害率均高于郊区,一方面可能与城区人群密度、建筑物密度较高及城区室内小气候更适合蜚蠊生存有关,另一方面虽然城区环境卫生要求严格,但是隐蔽地方如农贸市场柜台下、餐饮后厨缝隙处等清理困难,因此,城区卫生管理并不能只局限于表面,应更加深入蜚蠊生存活动的隐蔽区域。西安市蜚蠊密度和侵害率不具相关性,说明蜚蠊的侵害区域可能更局限于某些场所,比如城区的餐饮行业和农贸市场等。

蜚蠊生命力顽强,适应能力强,防制难度大,尤其是西安市蜚蠊病原体携带率较高^[4],虽然密度和侵害率处于低水平,仍不能掉以轻心。由于目前化学杀虫药品的滥用,蜚蠊对常用杀虫剂有了不同程

度的抗药性^[8,14],因此在制定防制措施时应根据监测结果,因时、因地制宜制定有针对性的综合性防制措施,才能起到事半功倍的作用。

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