

HUNTING BEHAVIOR OF THE ORIENTAL HORNET, *Vespa orientalis* L., AND DEFENSE BEHAVIOR OF THE HONEY BEE, *Apis mellifera* L., IN IRAQ

Murtadha K. Glaiim

Department of Plant Protection, College of Agriculture, Kerbala University,  
Karbala, Iraq

E-mail: [murtadha\\_kareem@yahoo.com](mailto:murtadha_kareem@yahoo.com)

ABSTRACT

When the guard honey bees, *Apis mellifera* L., form a clump at the hive entrance or on the flight board, the oriental hornet, *Vespa orientalis* L., either creeps toward the clump or hovers over it in order to take a bee. Once the hornet creeps, only few bees facing the hornet become alert, rock their heads and antennae, open their wings, and take a posture of defense. The rest of the clump stays listless without any signal of concern. However, the clump stays dense and the defending bees do not detach themselves neither from the rest of the clump nor from each other. For this reason, it is very difficult for the hornet to grab a bee unless the latter makes a "mistake" by detaching herself from other adjacent bees. If the hornet grabs such a bee, the other defending bees will not attack the hornet to free that bee even when the latter is one centimeter from the others. The defending bees can capture the hornet only when the latter grabs one of them which stands very close to the others. The hornet seems very "aware" of such a situation; hence she seldom becomes a captive.

On the other hand, hovering over the clump makes it easier for the hornet to grab a bee. The hovering puts all the clump, rather than part of it, on alert. If the hornet is persistent, which is not often the case, then the clump will no longer be dense. The bees will panically disperse all over the flight board; hence the hornet can find a detached bee and grabs it easily.

The hornet also waits on wing in front of the hive to capture an outgoing or incoming flying bee but the latter usually maneuver to escape. Also, foraging bees reduce their activity during main hours of hornet presence.

Among the main factors reducing the hornet impact are the continuous chasing of hornets to each other and the non-persistent attempts of the hornets when they attack bee clumps.

INTRODUCTION

Matsuura and Sakagami (1973) cited that the genus *Vespa* was only confined to the Old World before *Vespa crabro* was accidentally introduced in the eastern North America and established there. At the present time; however, Dvorak (2006) cited that the present number of *Vespa* species introduced into Americas is three: *Vespa crabro*, *V. orientalis*, and *V. simillima*.

The world distribution of *Vespa orientalis* comprises northern part of Africa, south eastern Europe, south west Asia across Turkey and Arabian Peninsula to India and Nepal, the Sahara, Ethiopia and Madagascar, (Ishay et al., 1967). Fell (1997) cited that it is distributed from the Mediterranean to Japan.

Dvorak (2006) stated that he received one worker of *V. orientalis* found at Cozumel Island, Mexico in 1998. He believes that this find of *V. orientalis* from Mexico represents the first known locality of this species in the Americas.

### Hunting Behavior of the Oriental

The oriental hornet, *V. orientalis* L., is one of the most important pests attacking honey bee colonies in many countries (Ishay *et al.*, 1967; Klein and Adler, 1996; Gomaa and Abd El-Wahab, 2006; Haddad *et al.*, 2006). A part from the damages in the bee colonies, the hornet causes a damage to grape and date fruits (Ibrahim and Mezid, 1967). The apiaries are places where the hornet can find the best combination of proteins from animal origin (bees and larvae) and carbohydrates (nectar and honey). Beekeepers in all regions of Iraq are familiar with the fact that this hornet is one of the key pests attacking honey bee colonies, *Apis mellifera* L., beside the bee eater, *Merops* spp., and the introduced mite, *Varroa jacobsoni*.

The present study, as far as we know, represents the first attempt in Iraq to reveal the strategies carried out by the hornet when attacking honey bee colonies and the latter strategies for defense under the local conditions in Iraq. Revealing such strategies of attack and counterattack may help in controlling this key pest. Many studies have been conducted a broad on this subject but they involved other geographical races of *Apis mellifera* (Ishay *et al.* 1967; Mastura and Sakagami, 1973; Haddad *et al.*, 2006; Papuchristoforou, *et al.* 2007). These studies revealed that different species and races of honey bees exhibit different types of behavior of counterattack against different species of hornets.

### MATERIALS AND METHODS

The study was carried out in central Iraq where the honey bee, *Apis mellifera* L., is kept in modern Langstroth hives. The honey bee race found in this area is not pure. It is a random cross between the native race and introduced races, respectively *Apis mellifera carnica* which was introduced at large scale state projects in the 1970's and 1980's from Egypt. It is worth mentioning that Brother Adam believes that the native race of honey bee in Iraq is a subdivision of *A. M. syriaca* (Abdellatif *et al.* 1977). The study was conducted during 1988-1990 in Baghdad, Diyala, and Al-Anbar provinces. It is well known that summer season in these areas is very dry and hot, for maximum temperature may reach about 50°C with no rain at all.

The notes on attack and counterattack behaviors were recorded through direct visual observations and by using video camera films. In all cases these behaviors were recorded as they took place naturally in the field without any kind of interruption or interference.

### RESULTS AND DISCUSSION

It is very common to see the workers of the oriental hornet, *Vespa orientalis* L., in the bee yards during the day time in summer and fall seasons in Iraq. Worker hornets; however, do not spend all the time in hunting activity. They could be seen either flying in front of the hives, standing on the ground, chasing each other, attacking honey bees, or seeking dead bees and hornets. We may conclude that there are two behavioral factors minimizing the danger of the hornet on honey bee colonies. First, it seems that the hornet is usually cautious, hesitant and not that persistent in every one of the above mentioned activities. Second, worker hornets spend a lot of time chasing each other. If the hornets were persistent and cooperative, or at least did not chase each other, they could cause a much more catastrophic damage to beekeeping industry. On the other hand, the local honey bee in Iraq exerts a modest strategy of defence. This strategy is not that keen and effective such as that used by the Japanese honey bee, *Apis cerana cerana*, but it seems more effective than that of the Italian race of honey bee, *Apis mellifera ligustica*, as it will be discussed later.

The hornets fly in the bee yard in a zigzag or undulating path as though they try to avoid barriers standing in their way. Also, they suddenly stop or change their flight direction for unclear reason. When they stand or walk on the ground, they seem busy as though they are searching for something on the ground. This behavior takes place even when they are found on a bare ground devoid of any potential source of food such as dead bees and / or remnant of sugar syrup, etc.

M. K. Glaiim

The hornets face no difficulty at all in grabbing and taking creeping bees in front of the hives since these bees are usually cripple or sick such as those heavily infected by the ectoparasitic mite, *Varroa jacobsoni*. Dead honets of the same species and dead bees are also collected to be used as food. The hornets that are mechanically killed by the beekeepers are taken very quickly by the hornets. We disagree with Ishay *et al.* (1967) who stated that dead bees are totally preferred to dead hornets to the extent that, "dead hornets were collected only after all bees had been collected". When we killed hornets, honey bees, small grasshoppers, and dragonflies and put them near each other on the ground, we noticed that the hornets took them indiscriminately. The hornet alights on the ground before she grabs and takes a creeping bee or a dead bee or hornet. We have never observed a hornet taking a prey on wing as far as this prey is standing, walking, or lying on the ground or any support.

Chasing of hornets to each other takes place whether they are walking or flying. In most cases, this antagonism does not lead to death of the hornets since they are not persistent in their chasing process. It seems that the hornets tend only to expel other rival ones rather than killing them. In one rare occasion, we observed two hornets that fought each other until one of them was killed and used as a food by the other. Ishay *et al.* (1967) found that this antagonism takes place only among hornets belonging to different nests while the hornets of the same nest cooperate with each other in their hunting process.

The hornets wait on wing in front of the hives during the time of foraging activity of the bees. They grab and take the bees while both of them are on wing. However; the success of hunting in this case is not guaranteed for two reasons. First, many bees are able to free themselves after being grabbed by the hornets. It seems that a hornet needs to stand on the ground or any support to insure a successful grasp of a bee. Second, the bees usually avoid flying in a straight line when they find hornets waiting in their flight path. Furthermore; worker honey bees are faster than worker hornets. Ishay *et al.* (1967) found that the speed of flight of the worker hornets was about 2.6-3.8 m/sec. The same authors reported that a honey bee on a windless day will fly at a speed of 7.5 m/sec unloaded and at 6.5 m/sec while carrying a load. However; we found that the hornets were more successful in capturing the bees when the latter were flying rather than standing and forming clumps on the flight boards or at hive entrances, especially when these clumps were large. The foraging bees usually reduce or even cease their flight when the number of hornets increases in the bee yard, and this is considered as an indirect effect of this pest.

The other easy means for the hornets to capture bees are through waiting at small openings and crevices in the hives and through hunting at water sources. The openings and crevices in the hives are used by some bees as hive entrances instead of the main ones. The hornets can capture the bees entering or leaving such openings easily since no guard bees are found at them. Also, we found that the smaller the opening or crevice is, the higher the opportunity a hornet has to capture a bee since the latter has a little chance to maneuver or escape. The hornets come to water sources either to drink water or to capture bees. Some of these hornets were found to visit these sources only for hunting. In residential areas where people keep honey bees, it is common to see bees, hornets and other species of wasps at the water sources such as water taps, leaky water tanks (Figure 1) and evaporative air coolers.

The most difficult situation for the hornets is when they try to capture bees forming a dense clump at the hive entrance, (Figure 2), especially when the colony is strong and populous. The hornets in such a situation follow one of two ways. They either creep up on the flight board toward the clump or hover over it. When a hornet creeps, all the clump bees stay very close to each other, and only few bees that face that hornet become alert and ready for counterattack. The rest of the clump stay listless as though the attack do not concern them. When the hornet becomes very close to the clump, ca. 2cm., these few bees take a gesture of defense. They rock their heads and antennae and open their wings, but they do not detach themselves neither from each other nor from the rest of the clump. When the hornet move closer toward

### Hunting Behavior of the Oriental

these bees, ca. 0.5cm, the latter raise their forelegs and protrude their mandibles. One or more of these bees move cautiously in very short and hesitant steps toward the hornet. Also, some of these bees retreat and enter the center of the clump while other bees volunteer to replace them in facing the hornet, and so on. This continuous replacement of defending bees might be due to the “panic” imposed upon the bees by the hornet. However, the hornet can not usually capture a bee unless she distances herself at least one cm from the rest of the defending bees. We could not observe a hornet that captured a bee as long as she stood very close to other bees. But, once a bee makes a “mistake”, she becomes an easy prey since she can not resist the hornet that overwhelmingly overpowers her. If the hornet grabs such a bee, she will not find a help from her mates to free her even when she is about one cm from them. The defending bees can capture the hornet only when the latter grabs one of them which stands very close to the others. It seems that the hornet “realizes” this fact; hence she seldom becomes a captive. But, sometimes the hornets become too “desperate” and commit the mistake which leads to their capture. The hornet can not be captured unless more than one bee attack her at the same time. She tries vigorously to free herself, but she is usually encircled very quickly by more bees that are encouraged to participate in the counterattack. The bees usually pull the hornet inside the hive, but the hornet tries to pull herself together with the engaging bees far away from the clump. If she succeeds in this attempt, especially when she and the attacking bees fall down on the ground, the hornet usually succeeds not only in freeing herself but also in grabbing and taking one of the attacking bees. It seems that the bees use their legs and mandibles to grab and pull the hornets. When we inspected dead hornets after they were killed by the bees, we did not find bee stings on their bodies. Papachristoforou *et al.* (2007) stated, “Asian honeybees have been shown to kill hornets by thermo-balling, in which they surround a hornet to form a ball within which the temperature increases to a lethal level. We report here that Cyprian honeybees, *Apis mellifera cypria*, kill their major enemy, the Oriental hornet, *Vespa orientalis*, in a different way-by asphyxia-balling, in which the Cyprian honey bees mob the hornet and smother it to death”. This mechanism explains how the bees kill the hornets, since the bees can not penetrate the hornet’s tough armour with their stings.

We have already mentioned that the hornets are not that persistent in their course of attack on bee clumps. They usually give up their attempts after a while and leave the scene, especially when they face a serious resistance. But, we could observe in one occasion a single hornet that spent seven consecutive minutes in a persistent and continuous attack until she was finally able to capture a bee. There were about 50 bees making a dense clump at the hive entrance. The hornet crept toward the clump and started her attempt to capture a bee in vain, since the defending bees were very close to each other. After about five minutes, the bees started a retreat movement into the hive, for it seems they could not withstand such an unusual persistent attack. However, their retreat was gradual and organized, except one bee that failed to be close enough to her mates. She was less than one centimeter from the nearest bee; hence the hornet pounced on this bee and grabbed her easily.

The other way used by the hornets to capture bees making a dense clump on the flight board is by hovering over the clump. In most cases, hovering lasts only a few seconds since the hornets give up their attempts and alight far away from the clump. Once a hornet hovers over the clump, most of the bees are put on alert in contrast to the situation when a hornet creeps toward them. The bees also rock their heads and antennae and open their wings. However, hovering for few seconds does not separate the bees from each other. But, if the hornet is persistent and hovers for a longer time, then the clump will no longer be dense (Figure 3). Some bees, especially those found at the edge of the clump, chase the hovering hornet, and they even reach the edge of the flight board far away from the clump core (Figure 4). While the bees are busy in their chasing movement, they separate themselves from each other; hence the hornet alights and take one of them. When more than one hornet hover over

M. K. Glaiim

the clump, the latter is divided into many small groups (Figure 5). Sometimes, the clump takes the shape of a long strip (Figure 6). We noticed that hovering hornets tend to retreat backward toward the edge of the flight board to entice the bees following them far away from the hive entrance where the core of the clump is usually found.

Ishayet *al.* (1967) described the defense behavior of both the Syrian race, *Apis mellifera syriaca* and Italian race, *A. m. ligustica*, against the attack of *Vespa orientalis* in Palestine. It seems that the behavior of the honey bees in Iraq resembles that of the Syrian race. On the other hand, the behavior of the Italian race is less effective. Ishayet *al.* (1967) stated, "In most cases, the hornet will approach to within 1.5cm. of one of the bees standing at the entrance of the bee hive. It will then entice the bee to chase after it by executing sharp movements of retreat. The bee leaves its hive-mates and follows the retreating hornet, gradually closing the gap between them. The hornet suddenly pounces on the bee, grabs it with its legs and soars straight up".

Haddadet *al.* (2006) confirmed previous observations of a reduced flight activity of honey bees elicited by the attack of *V. orientalis* in Jordan. They also found that *A.m. syriaca* had superior ability to withstand hornet attacks compared with *A. m. ligustica*. They also found that traditional bee hives in Jordan might be better suited to withstand attacks compared to modern Langstroth hives.

In Japan, Matsuura and Sakagami (1973) stated that the Japanese honey bee, *Apis cerana cerana*, has developed an excellent defense against *Vespa mandarinia*, while the introduction of the European honey bee, *Apis mellifera*, offered a "golden" opportunity to this hornet. The hornet never visits colonies of the Japanese honey bees placed near those of the European species. These authors found that *A. mellifera* defends its colony through solitary counterattack while *A. cerana cerana* developed two skillful and effective defense techniques, both not possessed by *A. mellifera*. One of the techniques is passive, the absence of solitary counterattack while the other is active, a rapid mass attack. Ironically, the Japanese honey bee is unable to resist the pillage by the European honey bee! Subbiah and Mahadevan (1958), however, mentioned that *Vespa cincta* and *V. tropica var. haematodes* are serious pests of the Indian honey bee, *Apis cerana* in South India. They carry off the workers of the bees in great numbers from the hive entrances. In Pakistan, Muzaffar and Ahmed (1986) stated that *Vespa basalis* and *V. velutina pruthi* wait on wings in front of the hives and carry the bees of *Apis cerana* to their nests since they overpower these bees during their flight. The hornets of *Vespa orientalis* and *V. tropica* are fought back and defended upon by these bees. However; *Apis mellifera* is more susceptible to hornet attack than *A. cerana*. Unfortunately, all these workers did not mention the races of *Apis mellifera* involved in these three countries.

When a hornet grabs a bee with her legs, she flies rapidly in a straight line and alights on nearest tree branch or a grass or a thin stick of those covering the hive shade. If there is nothing of these materials, the hornet alights on any grass found in the vicinity. After alighting, the hornet, with her head down, hangs with one or two hind legs and starts to cut the bee head, wings, legs and abdomen and takes only the thorax to her nest. The same description was also mentioned by Ishayet *al.* (1967). Caron and Schaefer (1986) found that *Vespa carbro* also keeps only the thorax for the flight back to the nest. If the prey is too heavy, the hornet will chew up and fetch the meat while both hornet and the prey are on the ground. When we killed adult grasshoppers and put them on the ground in front of the hives, the hornets alighted beside them quickly and started attacking them.

Absconding of honey bee colonies is one of the results of hornet attack. When the colonies are heavily attacked they dwindle until they either perish or desert their hives. We found many hives, that were occupied by bee colonies before only few days, devoid totally of adult bees. When we opened these hives we found only worker hornets taking the food.

### Hunting Behavior of the Oriental

Muzaffar and Ahmed (1986) stated that at Islamabad the European honey bee, *Apis mellifera*, colonies having normal or even clipped queens abscond their hives when these colonies are heavily attacked by *Vespa* spp. including *V. orientalis*.

### REFERENCES

- Abdellatif, M. A.; A. M. Abou-Elnaga; M. H. Ali; P. M. Shakir and M. K. Al-Jalili. 1977. Biometrical studies on Iraqi honey bees. *J. Apic. Res.* 16: 143-144.
- Caron, Dewey M. and Paul W. Schaefer. 1986. Social wasps as bee pests. *Amer. Bee J.* 126: 269-271.
- Dvorak, Libor. 2006. Oriental hornet *Vespa orientalis* Linnaeus, 1771 found in Mexico (Hymenoptera, Vespidae, Vespinae). *Entomological Problems*, 36:80.
- Fell, R. D. 1997. Insects: Hymenoptera (ants, wasps and bees). In Morse, R., Flottum, K. (eds.), *Honey bee pests, predators and diseases*. A. I. Root Company; Ohio, USA: PP. 165-200 (3rd edition).
- Gomaa, A. M. and T. E. Abd El-Wahab. 2006. Seasonal abundance and the efficiency of yeast liquid culture (*Candida tropicalis*) as bait for capturing the oriental wasps (*Vespa orientalis* L.) under Egyptian environment. *J. Appl. Sci. Res.* 2: 1042-1046.
- Haddad, N.; S. Fuchs and Ahmed Batainha. 2006. Decrease of flight activity caused by *Vespa orientalis* at the flight entrance of *Apis mellifera syriaca* in Jordan. *Proc. 2nd. Europ. Conf. of Apidology EurBee, Prague (Czech Rep.) 10-16 Sept., 2006.* P. 77.
- Ibrahim, Mohammad M. and Mahmoud M. Mezid. 1967. Studies on the oriental hornet. *J. Agric. Res., Minis. Agric., Cairo* 2:115 – 130 (In Arabic).
- Ishay, J., H. Bytinski-Salz, and A. Shylov. 1967. Contribution to the bionomics of the oriental hornet (*Vespa orientalis* Fab.) *Isr. J. Entomol.* 2: 45-106.
- Klein Z. and H. Adler. 1996. Wasps and their control in Israel. *The Joint Int. Conf. FAOPMA-CEPA on pest Control in the 21st century.* Tel Aviv, Israel. 8-12 May, 1996. P.254.
- Matsuura, Makoto and Shoichi Sakagami. 1973. A. bionomic sketch of the giant hornet, *Vespa mandarinia*, a serious pest for Japanese apiculture. *J. Fac. Sci. Hokkaido Univ., ser. II, zool.* 19:125-162.
- Muzzaffar, Nasreen and Rafiq Ahmed. 1986. Studies on hornets attacking honey bees in Pakistan. *Pakistan J. Agric. Res.* 7: 59-63.
- Papachristoforou, Alexandros; Agnes Rortais; Georgia Zafeiridou; George Theophilidis; Lionel Garanery; Andreas Thrasyvoulou and Gerard Arnold. 2007. Smothered to death: Hornets asphyxiate by honeybees. *Current Biology* 17:R795-R796.
- Subbiah, M. S. and V. Mahadevan. 1958. *Vespa cincta* Fabr. – a predator of the hive bees and its control. *Ind. J. Vet. Sci.* 27: 153-154.

M. K. Glaim



Figure 1. Worker honey bees, *Apis mellifera* L., collecting water

Hunting Behavior of the Oriental



Figure 2. Guard honey bees, *Apis mellifera* L., making a clump in front of a hive entrance to defend their colony against an attack of a worker oriental hornet, *Vespa orientalis* L.

M. K. Glaim



Figure 3. A honey bee clump starts losing its density because of a persistent and continuous hovering of a worker hornet.

Hunting Behavior of the Oriental



Figure 4. Some guard bees detaching themselves far a way from the clump core

M. K. Glaim

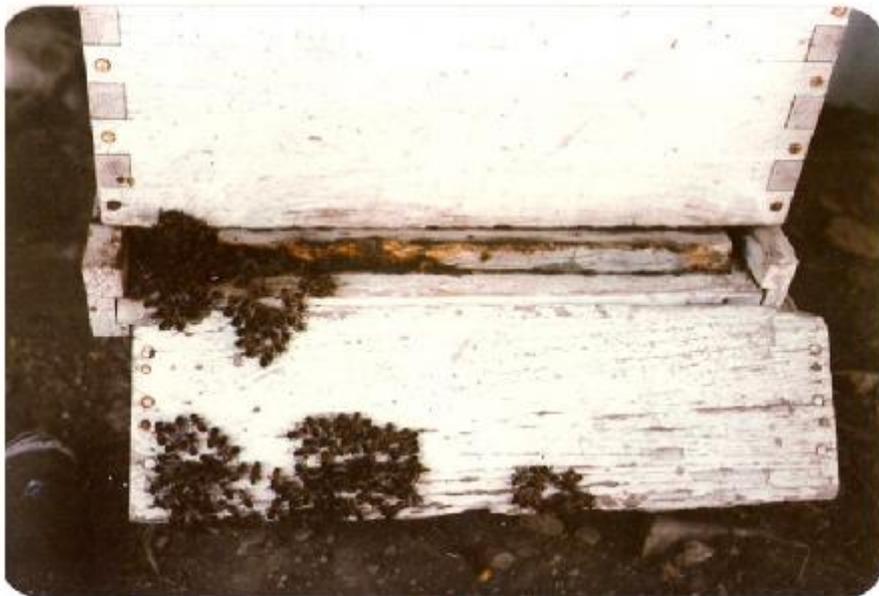


Figure 5. A honey bee clump is divided into many small groups after many hornets hovered above it simultaneously.

Hunting Behavior of the Oriental



Figure 6. A honey bee clump taking the shape of a long strip after hornets enticed the bees following them far away from hive entrance.

بمحللاً رومنزلا ك ولسبي قشلا ا) Vespa orientalis L. بولاً ليلس ل احنة مامهي ف  
Apis mellifera L. قرا ل فليح ل لك ل ليعا فدا اولس لا و

ميدغ بيرك ضوم

ت ا ب لاة يقوم ق / نمار لايلا

للا بيرك مامج - قرا ل ا

#### قشلا ل ا

لسعل المجد نل سر المجات المجد ل احنة تلمد نعبى رولاً ا) Apis mellifera L. ليحدا مدنع  
رخلأا و ب ز لاة لملغن ل ف نيطل ل تقولى ليعوا ب لخال ل قشلا ا) Vespa orientalis L. اما  
تلا ماعنك ل م قح و ص ننتق الم ل م موفم تح أ مجد ل ا ا ه د ل ب ب م ح ز م ل ق ت ت. المجد  
ن مط ف ل م ل ا ل ا ل ق د ع ن ل ف ز ل ا ب و ب ن ا ع ش ل ك ل ذة ل ا ق م ل و ق ت ل و ب ق ر ا ل ل ا م ش ل ا  
الزنبور تدخل في حالة تنبه أو إنذار حيث تشاهد وهي ز رؤوسها وقرون استشعارها وتفتح  
أجنحتها وتتخذ وقفة تأهب للدفاع في حين تبقى بقية التجمع ساكنة ولا تصدر عنها أية إشارة  
تدل على الاهتمام بما يجري. لغاية هذا الحد فإن التجمع يبقى متماسكاً كما إن الشغالات التي  
دخلت في حالة الإنذار لا تفصل نفسها سواءً عن بعضها البعض أو عن بقية التجمع ولهذا  
السبب فإنه يصبح من الصعب جداً على الزنبور أن يمسك بإحدى النحلات إلا إذا اقتربت تلك  
النحلة " غلطة " بابتعادها عن النحلات للورات لها. وفي حالة كهذه وعندما يمسك الزنبور  
بتلك النحلة فلما سوف لن تجد من يبادر لنجنا والمجوم على الزنبور من كل النحلات  
الأخرى في التجمع بما في ذلك النحلات الداخلات في حالة التأهب والإنذار حتى لو كانت  
تلك النحلة لا تبعد سوى ستمتراً واحداً فقط عن حافة التجمع. لقد لوحظ بأن النحلات  
الداخلات في الإنذار لا تقوم بالقبض على الزنبور المذكور إلا إذا قام بمسك نحلة تقف ملاصقة  
لبقية النحلات ويبدو إن الزنبور " مدرك " لموقف كهذا ولذلك فإنه نادراً ما يقع في أسر تلك

### Hunting Behavior of the Oriental

النحلات . من جهة أخرى ، فإن قيام الزنبور بالحوم فوق ذلك التجمع يسهل الأمر عليه نسبياً للإمساك بإحدى النحلات إذا ما قورنت تلك المحاولة بمحاولة الاقتراب زحفاً ذلك لأن حوم الزنبور يدخل كل التجمع وليس قسماً منه فقط في حالة تأهب وإنذار . وإذا ما كان الزنبور الحائم مصراً ومثابراً في مسعاه هذا ، وهو أمر غير مألوف عادة ، فإن التجمع لن يبقى متماسكاً وسرعان ما ينفرط عقده حيث إن نحلات التجمع تتفرق لمع وتنتشر على عموم لوحة الطيران وهذا ما يسهل على الزنبور العثور على نحلة قد ابتعدت قليلاً عن زميلاً ويقوم عندئذ بالإمساك بسهولة ويسر . أما الطريقة الثالثة التي يتبعها الزنبور في القنص فتتمثل بانظاره محلقاً امام الخلية من أجل اصطيد إحدى النحلات العائدات من طلعة سروح وهي ما تزال في الجو ولكن مثل هذه النحلة عادة ما تلجأ للمناورة في خط طيرانها لكي تقلت من الاقتراب . يضاف إلى ذلك فإن النحل السارح يلجأ أيضاً إلى خفض معدلات سروحه خلال الساعات التي يشتد فيها التواجد المكثف للزنبور . إن من بين العوامل التي تقلل وطأة تأثير الزنبور هي كثرة انشغال أفرادها في مطاردات المستمرة لبعضها البعض من جهة وضعف الإصرار أو المطاولة التي تبديها تلك الأفراد عندما تقوم بمهاجمة تجمعات النحل الحارس عند مدخل الخلية من جهة أخرى .