

Monitoring of *Ips typographus* L. and *Pityogenes chalcographus*

L. swarming activity in Slovakia

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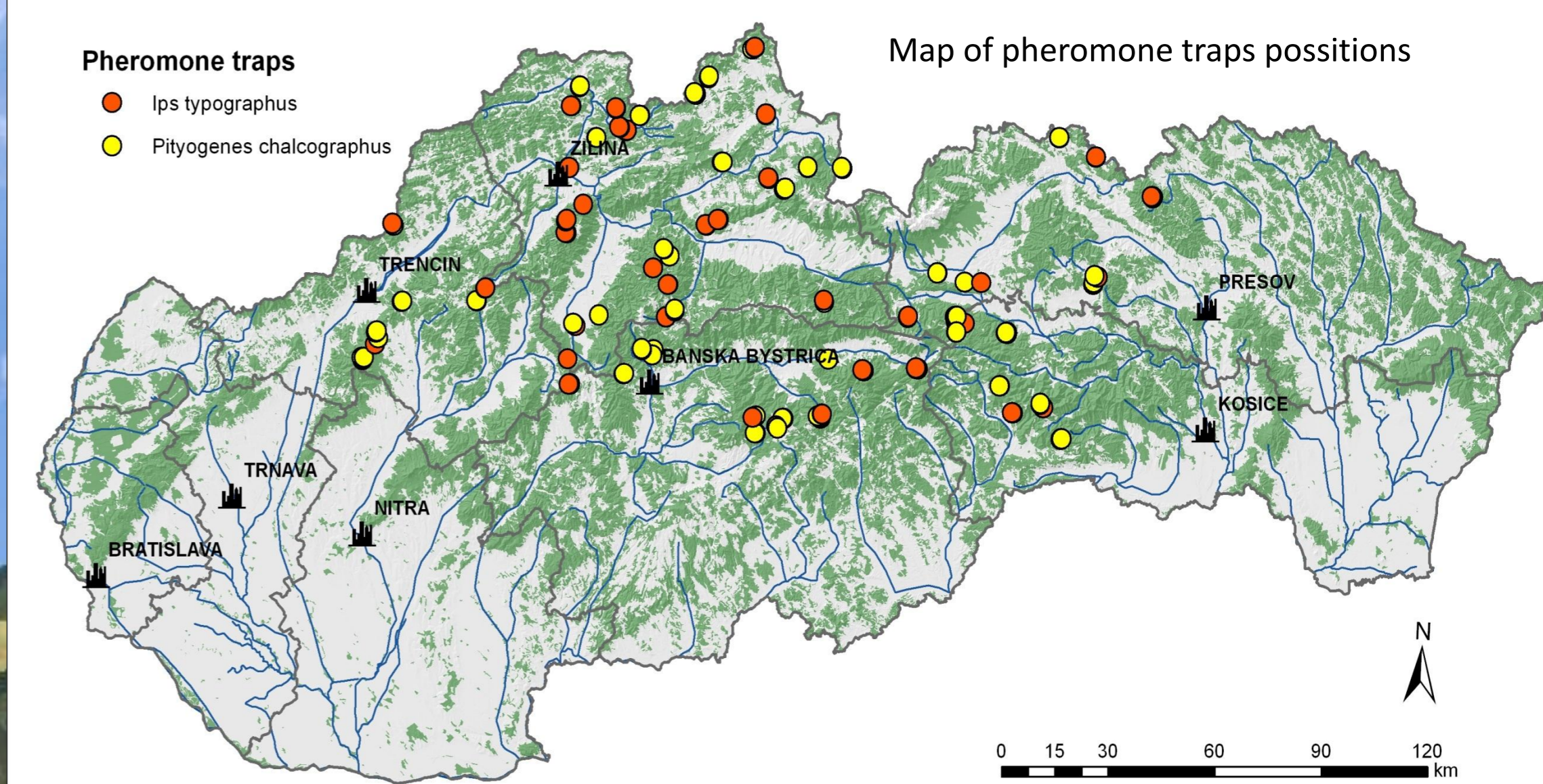


INTRODUCTION

The damage caused by bark beetles has become in last few years the most important problem in forest protection in Slovakia. Only in 2011 the amount of processed timber due bark beetles was 1,9 mil. m³ what was nearly 48% of whole sanitary felling in this year. More than 1,9 mil. m³ of processed bark beetle attacked timber was in spruce forests. Nearly all processed timber from the bark beetle calamity was attacked by *Ips typographus* and *Pityogenes chalcographus*. For better planning and protective activities in 2008 started the project of *Ips typographus* and *Pityogenes chalcographus* swarming activity monitoring. The aim of the project was to gather information about the swarming activity in the different locations around Slovakia.

MATERIAL & METHODS

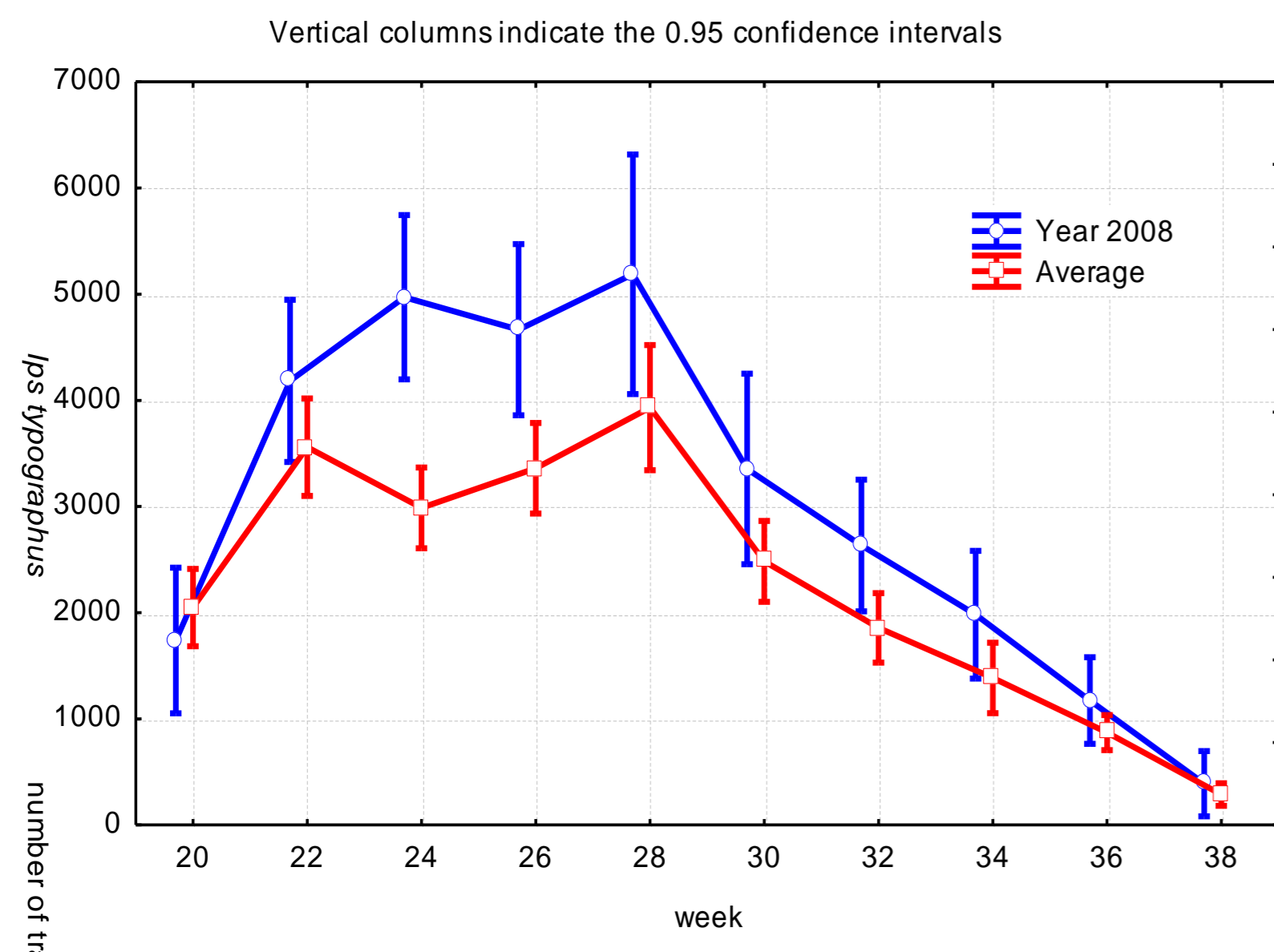
In the years 2008, 2009 and 2011 pheromone traps in most damaged locations were installed, baited by lures for trapping *Ips typographus* and *Pityogenes chalcographus*. About 100 traps were installed every year for both of species. The pheromone traps were annually placed in newly cut forest edge. Data was recorded every second week on Monday or Tuesday (table 1.). This synchronization gives us the opportunity to compare numbers of trapped imagoes in all the traps through the years.



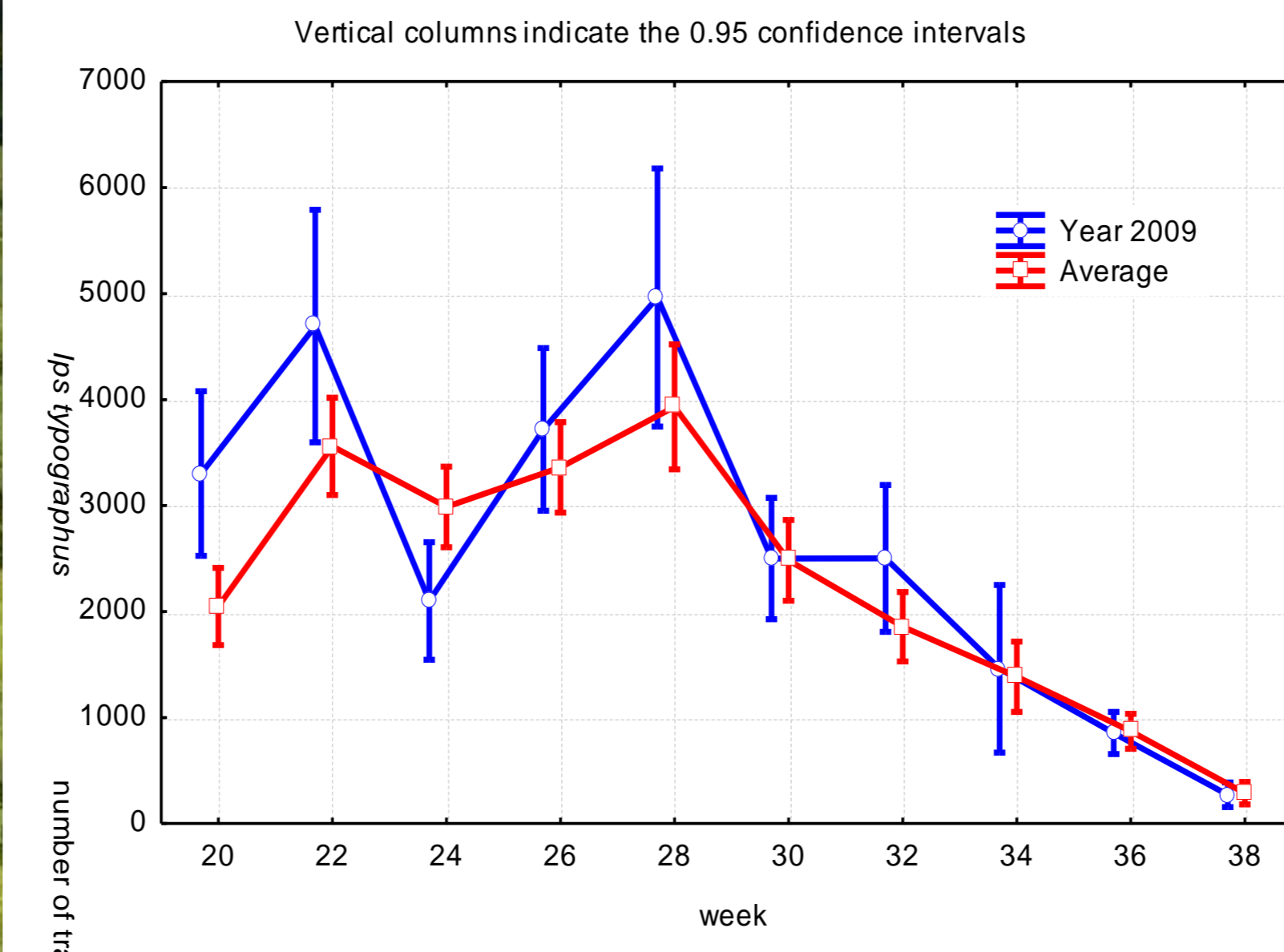
Tab. 1: Terms of pheromone traps control in the years 2008, 2009 and 2011

	18. week	20. week	22. week	24. week	26. week	28. week	30. week	32. week	34. week	36. week	38. week
2008	28.-29.4.	12.-13.5.	26.-27.5.	9.-10.6.	23.-24.6.	7.-8.7.	21.-22.7.	4.-5.8.	18.-19.8.	2.-3.9.	16.-17.9.
2009	30.4-1.5.	11.-12.5.	25.-26.5.	8.-9.6.	22.-23.6.	6.-7.7.	20.-21.7.	3.-4.8.	17.-18.8.	31.-2.9.	14.-16.9.
2011	2.-3.5.	16.-17.5.	30.-31.5.	13.-14.6.	27.-28.6.	11.-12.7.	25.-26.7.	8.-9.8.	22.-23.8.	5.-6.9.	19.-20.9.

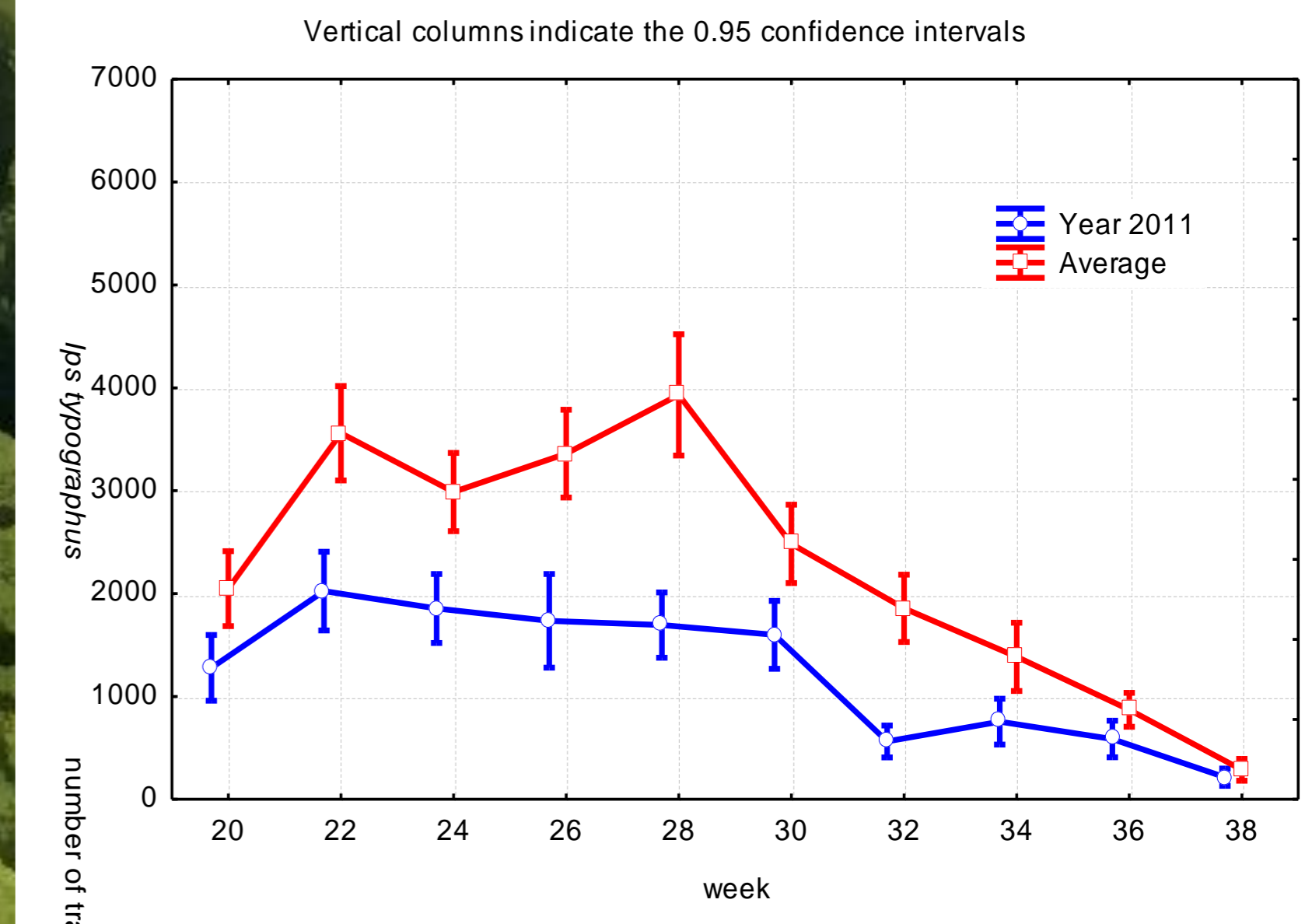
Swarming activity of *Ips typographus* in the year 2008 compared to average from years 2008 - 2011



Swarming activity of *Ips typographus* in the year 2009 compared to average from years 2008 - 2011



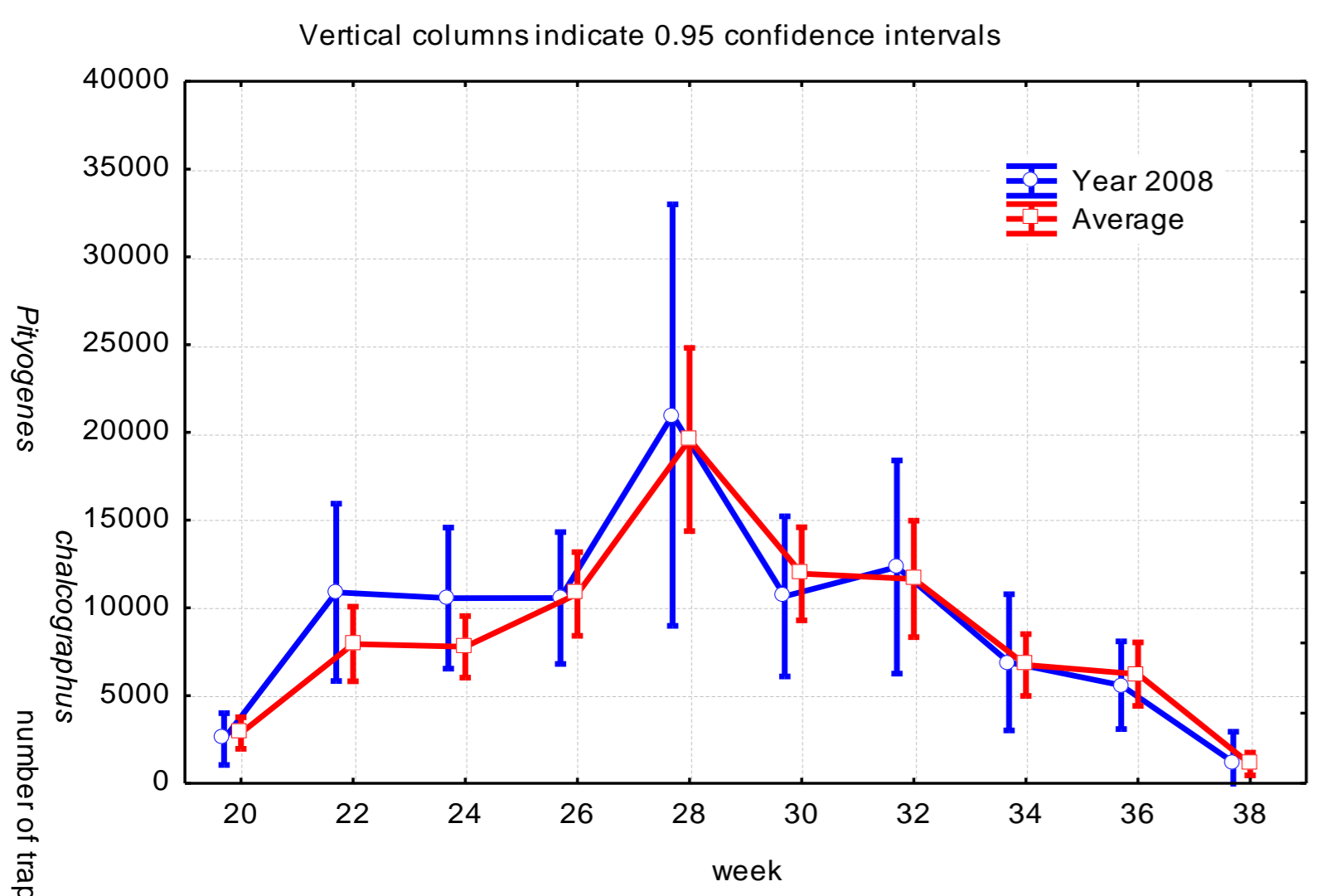
Swarming activity of *Ips typographus* in the year 2011 compared to average from years 2008 - 2011



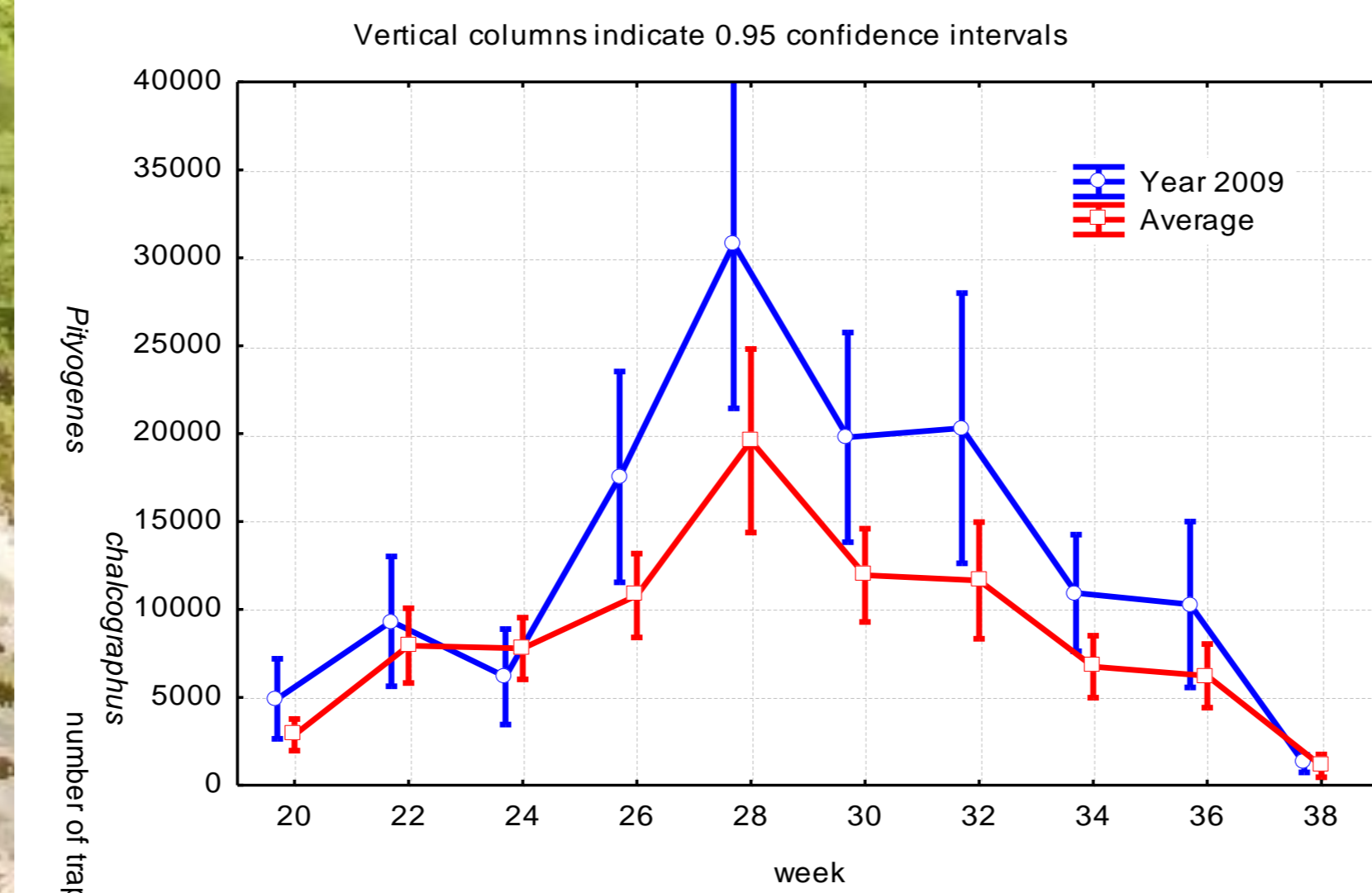
Ips typographus

Swarming of *Ips typographus* usually starts at the end of April or the first days of May. Over the next four weeks, there is a rapid increase in its flight activities. Peak of the first swarming took place in late May and early June. In 2009, this swarming peak was significantly influenced by entering of cold weather. Consequently, the flight activity decreased by more than half. This drop can be observed in graph from 2009 if we compare trapping in the 22th and 24th week. Swarming in a relatively balanced strength continued, in all three years, up to the end of July. Significant decrease in flight activity of spruce bark beetle were recorded in late July and early August and with more or less extents, continued until the second half of September, when most of the traps reported minimum or zero trapping.

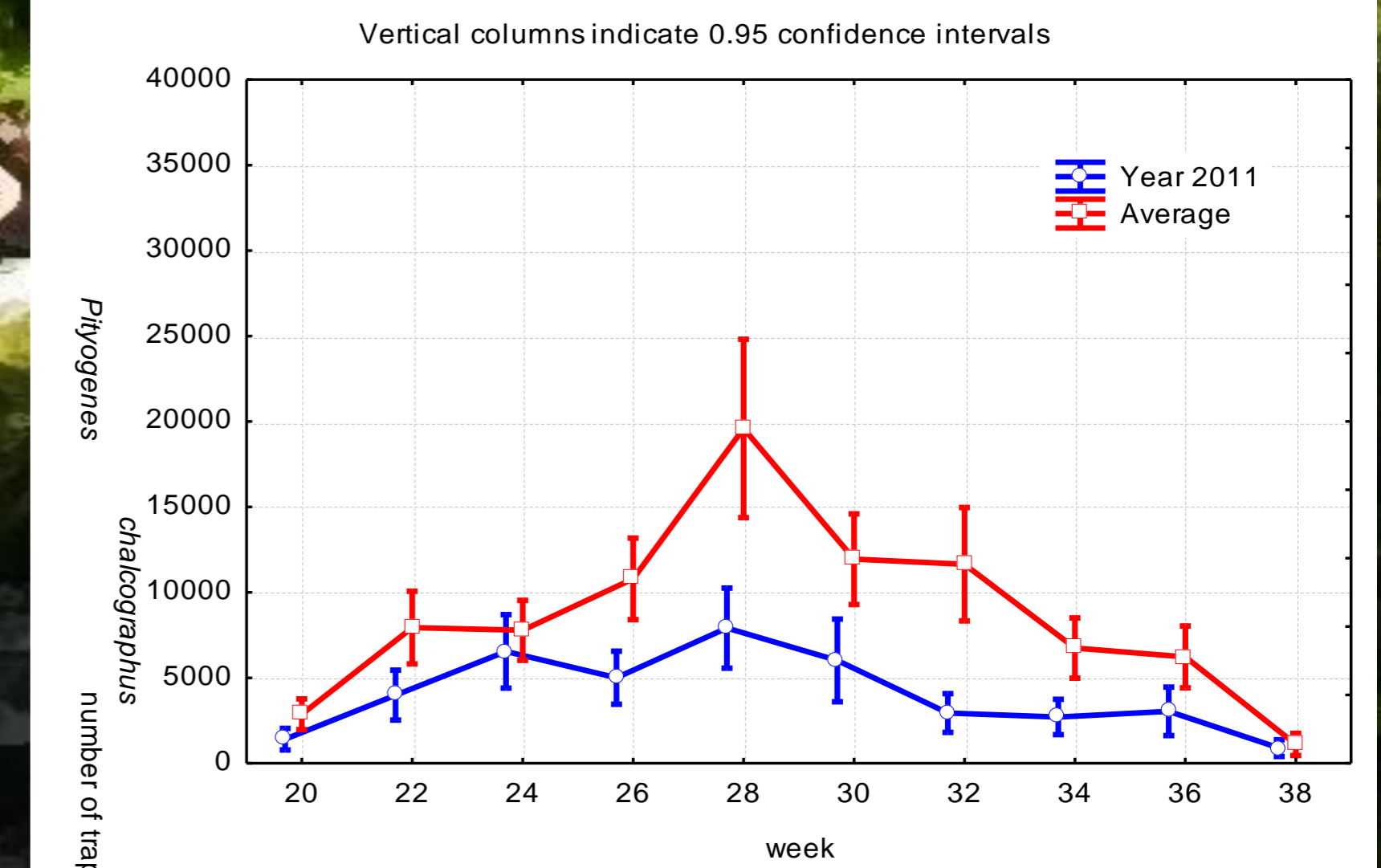
Swarming activity of *Pityogenes chalcographus* in the year 2008 compared to average from years 2008 - 2011



Swarming activity of *Pityogenes chalcographus* in the year 2009 compared to average from years 2009 - 2011



Swarming activity of *Pityogenes chalcographus* in the year 2011 compared to average from years 2009 - 2011



Pityogenes chalcographus

Swarming of *Pityogenes chalcographus* is at first sight different to *Ips typographus* swarming activity. It begins in the end of April and beginning of May, similar to *Ips typographus*. Increasing of its flight activity is very slow and in time when spruce bark beetle is highly active, swarming of *Pityogenes chalcographus* has gradually increasing character. A significant increase occurs in the second half and in the end of June. The peak of its flight activity happens at the beginning of July. Then the flight activity gradually decreases until the second half of September, when the swarming across most of Slovakia is almost finished.

Conclusion

The outcomes of the project and the results obtained are useful for planning of forest protection activities in forest practice and allow swarming prediction of both species. On the base of results of compared years we can pronounce the decrease population density of both species, what corresponds with amount of processed wood attacked by bark beetle in monitored period. Project of bark beetle swarming activity monitoring will continue for the years 2012 and 2013. Then the data evaluation will be carried out according to certain regions, climate, altitude or exposition.

Acknowledgement:

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