

Nalaz Carp edema virusa uzročnika bolesti CEV u šarana i bolesti spavanja u Koi šarana-prijetnja uzgoju šarana u Hrvatskoj?

Finding of Carp edema virus causal pathogen of CEV disease in common carp/ Koi sleepy disease-emerging treat for Croatian common carp production?

13. Međunarodna konferencija o akvakulturi- Aquaculture Conference
„Suradnja proizvodnje i znanosti-temelj uspješnog održivog razvoja akvakulture“
Vukovar, Republika Hrvatska 29.-30. 11. 2018.

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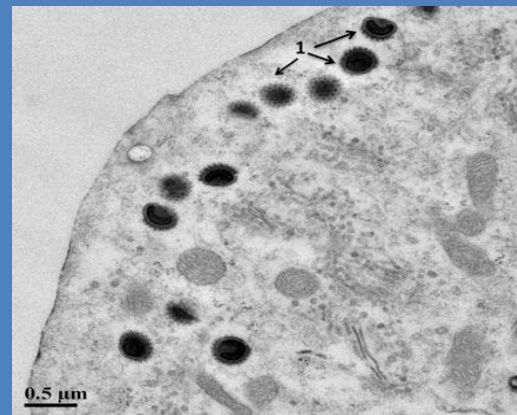
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CEV u šarana i bolesti spavanja u Koi šarana

- CEV u šarana i KSD u Koi šarana (od 1974. Japan, Murakami et al., 1976)
- CEV bolest („edemska viroza šarana”)
- Uzročnik poxvirus ; („nova vrsta u ribljim poksvirusima”)- (Way and Stone 2013; Waltzek et al. 2014)
- **Genetske osobine virusa**>3 linije
 - koi šaran Japan >genogrupa II
 - šaran >genogrupa I
 - šaran Poljska >genogrupa III (M Matras et al. 2016.)

bolest se ne prijavljuje niti OIE niti EU



T.E.M. – u epitelnim stanicama škrga sferoidalne čestice
Slika:Shoreh Hesami ; Izvor:<https://edis.ifas.ufl.edu/fa189>

- **CEV** Europa od 2011.> UK Koi šaran > arhivski uzorci šaran 1998. 1999.
- Francuska 2010, Italija 2010, Nizozemska od 2014 (2004), Austrija 2014, Češka 2013, Poljska 2013, Njemačka od 2015, Srbija 2017

Table 1. Carp edema virus (CEV) disease in Europe: the current situation. Personal communications included in this table are taken from reports presented at the CEV workshop (12–13 January 2015; EURL 2015a) or reported to O. Haenen by members of the CEV network

Country	CEV cases/outbreaks & detections in archived samples	Case detail	Water temperature (°C)	Additional positive cases (year)	Reference
Austria	Koi, first case 2014 Common carp, first case 2014; also detected in archived DNA from 2013	25% mortality in adult koi 16% mortality in ~1 kg carp — all confirmed by PCR	~10 7–15	2 (2014)	Lewisch et al. (2015)
Czech Republic	Koi, first case 2014 Common carp, first case 2013; also detected in archived DNA	Single mortality ~60% mortality in 2 yr old carp	15 13–14	Further cases in 2015 & 2016	Veselý et al. (2015), T. Veselý (pers. obs.)
France	First case in 2013	Adult koi and common carp, 0–90% mortality; PCR and/or qPCR (gills)	Outbreaks in winter & May/July	4 (2014), 1 (2015)	Bigarré et al. (2016)
Germany	Koi, first case in 2009. First report in 2014 Common carp, first case in 2015; also detected in 2016 and archived samples from ca. 2011	First report — spring outbreaks in koi, many cases from 1 wholesale source; up to 100% mortality Clinical signs and losses up to 100% detected in spring and autumn of 2015 in 1–3 yr old carp	17–22; 10–12	Numerous linked and unlinked cases (2014–2016)	S. M. Bergmann (pers. obs.), Jung-Schroers et al. (2015), Bachmann & Keilholz (2016), M. Adamek (pers. obs.)
Italy	Koi, first case 2015 Common carp, first case 2014; also detected in archived DNA from 2010	Mortality in garden pond Mortality (<10%) in 1–2 kg fish	14–16 (further 13–15) 23 2010 case: 6–7	Numerous outbreaks (2015/16)	Pretto et al. (2015), M. Abbadi & A. Toffan (pers. obs.)
The Netherlands	Koi, first case 2013 Common carp, first case 2014; also detected in archived DNA from 2004	High mortality in juvenile & adult fish Heavy mortality (450 carp in 1 wk) in adult fish	First 9 (further 20–23) First 10 (further 6–10, 17–20)	3 (2014) 3 (2014), 3 (2015), 1 (2016)	Haenen et al. (2013, 2014), O. Haenen (pers. obs.)
Poland	Koi, first disease outbreak with mortality 2015; detected in archived samples from 2013–15 Common carp, first case in 2013, numerous cases detected in archived samples from 2013–15	5 cases from 1 wholesale source No mortality associated with detections. All confirmed by PCR	16–19 16–19		M. Reichert (pers. comm.), Matras et al. (2016)
Switzerland	Koi, detected in archived formalin-fixed, paraffin-embedded gill tissue from 2007	High mortality	January	2 (2016)	T. Wahli (pers. comm.)
UK	Koi, disease outbreaks 2016 Koi, first case in 2009 (Belgian site), first UK case in 2011 Common carp, first case in 2012; detected in archived samples from 2004, 1999 and 1998	No mortality High mortality in juvenile fish High mortality in adult fish	15–16 >16 6–9	6 (2012), 7 (2013), 2 (2014), 1 (2015), 1 (2016)	Way & Stone (2013), Haenen et al. (2016)

CEV u šarana i bolesti spavanja u Koi šarana

- Karakteristike CEV u koi šarana i šarana
- letragija, lelujavo plivanje, ležanje na trbuhu ili boku na dnu, enoftalmija, škrge zadebljale i nekrotične, otežano disanje, hipoksija
- **Okološni uvjeti**
- Temperatura vode i akutni stresni uvjeti > klinički pozitivni proljeće
- Europa> temperature vode i potvrđeni CEV
 - šaran od 6-10°C (također od 15-25°C)
 - koi šaran najčešće od 20-23°C (također od 9°C)



Slika: „Sleepy carps” Izvor: News, Faculty of Fisheries and Protection of Waters, Vodnany
<http://www.frov.jcu.cz/en/news-menu/research-in-the-spotlight/2324-sleepy-carps>

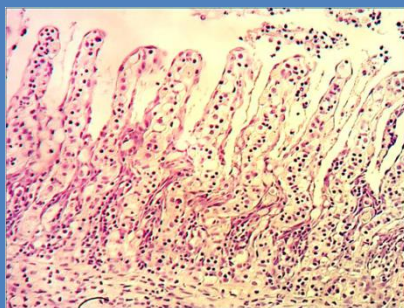
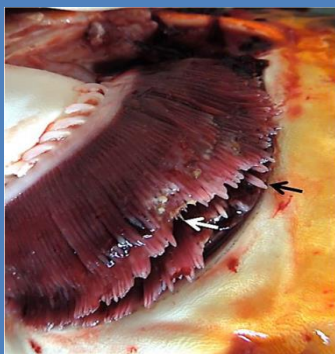


Foto: Dr. Nelly Scuda - Bayerisches Landesamt für Gesundheit und Lebensmittelsicherheit
Izvor: https://www.lgl.bayern.de/tiergesundheit/tierkrankheiten/virusinfektionen/carp_edema/ue_2016.htm

- Istraživanja
- >koi šaran - lako se inficira od bolesnih koi šarana značajno otporniji na infekciju šaranskim CE virusom
- >šaran - prijemljiviji na infekciju s bolesnog šarana, a otporniji na CE virus s oboljelog koi šarana
- Infekcija kohabitacijom > 4 vrste> šaran iz Amura ne obolijeva (*Adamek et al. 2017*)

CEV u šarana i bolesti spavanja u Koi šarana

- Istraživanja
 - >patološke promjene na škrgama> asfiksija
 - >multifaktorijalni problem> Flavobacterium vrste (*F. branchiophilum*) kopatogen



Slike: Jung-Schroers et al. 2015

Izvor: <https://bmcvetres.biomedcentral.com/articles/10.1186/s12917-015-0424-7>

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CEV u uzgoju šarana u Hrvatskoj

Nalaz Carp edema virusa uzročnika bolesti CEV - 2015.-2017.

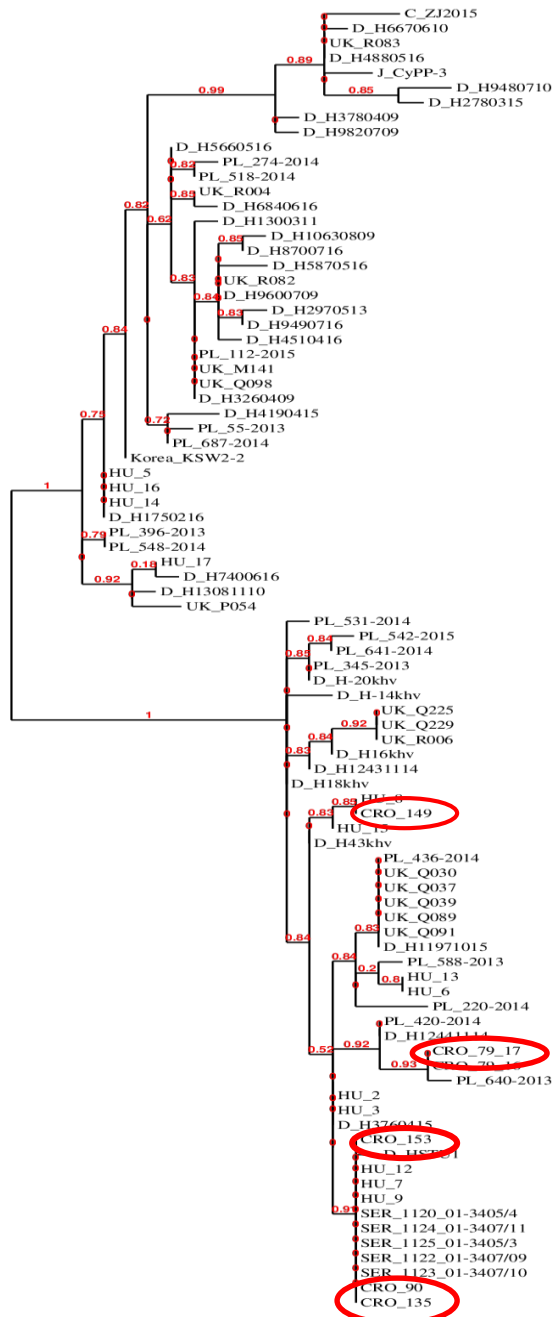
Istraživanje KHV poslije potvrđenih pozitivnih slučajeva bolesti u 2016.

29 šaranskih uzgajališta i 11 točaka uzorkovanja na otvorenim vodama u zonama rizika
i objekata športsko-ribolovnih društava

940 riba = 470 uzoraka

Reprezentativni uzorci sa svih lokacija pretraženi na CEV - 6 pozitivnih na 5 lokacija





>Sekvenciranje po metodi CEFAS
end-point PCR assay – produkti
sekvencirani s obju strana

>Filogenetska analiza sa PhylML
(Maximum Likelihood computation
method)

>**Svi izolati pripadaju genogroupi I**

CEV/KHV

Godina/mjesec	KHV/Ct	CEV/Ct/kopija	Temp. °C	Težina riba
2015/rujan.	-	+/35,17/1,82E+01	20,4	n/d
2016/travanj	-	-	14	2yr/ 100-500 g
2016/svibanj	+/20,09;33,66;35,69	-	16	2 yr/ 150-400
2016/svibanj	+	-	16	2 yr/ 200-400
2016/lipanj	+	-	21	3 yr / 1300
2016/lipanj	+	+/33,89/4,17E+01	21	1 yr / 80-110
2016/lipanj	+	-	22	1 yr / 60-90
2016/lipanj	+	-	22	3 yr / 1400-1600
2016/lipanj	+	+/34,61/2,60E+01	22	3 yr / 1200-1400
2016/lipanj	+	-	22	n/d
2016/srpanj	-	+/38,28/2,42	26,4	n/d
2016/srpanj	-	-	26	n/d
2016/lipanj	-	-	29	n/d
2016/srpanj	-	+/37,35/4,4	28	n/d
2017/kolovoz	-	+/31,12/5,1E+02	27	n/d

- ZAKLJUČCI

- Carp edema virus uzročnik bolesti CEV u šarana i bolesti spavanja u Koi šarana prisutan je u svjetskom uzgoju šarana
- Uzrokuje bolest i gubitke koji su u nekim slučajevima svrstani u idiopatske bolesti
- Različita infektivnost CEV genogrupa
- Značajnija je infektivnost istovrsnog izvora infekcije>šaran za šarana>koi za koi
- Različita otpornost na bolest među vrstama šarana
- Divlji šaran iz Amura otporniji na infekciju i ne obolijeva
- 0,5% NaCl kupka simptomi prestaju kliconoštvo ostaje

- PREPORUKE

- **Kontrolirati ponašanje ribe apatije/spavanje, izgled/stanje škrga u hladnijem periodu zima/proljeće**
- **Provjeriti na CEV**
- **0,5% NaCl**
- **Koristiti/uvesti linije šarana otpornije na virus i bolest**

Hvala na pozornosti



Otočić u obliku ribe; © Marko Vrdoljak

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